Original Research Article

Evaluation of Early Maturing Sugarcane Clones for Yield, Quality and Its Contributing Traits in East Coast Zone of Tamil Nadu

ABSTRACT

The field experiments were conducted at Sugarcane Research Station (TNAU), Cuddalore, Tamil Nadu. The four trials *viz*., Initial Varietal Trial (IVT), Advanced Varietal Trial - I plant (AVT- I plant), AVT- II plant and AVT-Ratoon. Initial varietal trial consists of eight test clones and three standards; in AVT I plant consist of five test clones and three standards, in AVT II plant and Ratoon, four entries and three standards. Observations were recorded for germination per cent (%), number of tillers (x1000/ha), number of millable cane (x1000/ha), stalk length (cm), stalk diameter(cm), single cane weight(kg) cane yield (t/ha), sucrose(%), CCS(%) and CCS yield (t/ha). The results revealed that, in Initial Varietal Trail, the clone CoC 13337 recorded higher CCS yield (17.92t/ha) followed by the clone CoC 13336 (17.25 t/ha). The Cane yield was maximum in the clone CoC 13337 (139.81 t/ha) followed by the clone CoC 13336 (134.26 t/ha). The sucrose per cent was maximum in the clone CoC 13337 (17.61%) followed by the clone CoC 13336 (17.57%). In AVT – I plant, the clone CoA 12322 recorded the higher cane yield (126.70 t/ha) followed by the clone CoA 12321 (123.23 t/ha) and CoA12323 (122.13 t/ha). The CCS yield was maximum in the clone CoA 12322 (15.92 t/ha) followed by the clone CoOr 12346. The CCS % was maximum in CoOr 12346 (12.75) followed by the standard CoC 01061. The clone CoOr 12346 recorded higher sucrose (17.87%) followed by standard CoC 01061 (17.74%). In AVT–II plant, clone CoC 11336 registered the higher cane yield (139.25t/ha) followed by the CoC 10336 (123.34 t/ha). The CCS yield was maximum in CoC 11336 (17.83 t/ha) followed by CoC 10336 (15.39 t/ha). The sucrose content was maximum in the clone CoC 11336 (17.62%) followed by CoC 01061 (17.48%). In AVT ratoon crop, among the test clones, clone CoC 11336 registered the higher cane yield (134.43t/ha) followed by the clone CoC 10336. The CCS yield was maximum in CoC 11336 (17.27t/ha) followed by CoA 11323. Hence, these promising clones in different trails could be advanced for further breeding programme for release as new sugarcane variety.

Key Words: *Sugarcane, Early Clones, cane yield, Sucrose %, CCS % and CCS yield*

1. INTRODUCTION

Sugarcane (*Saccharum spp*. hybrid) is a major commercial crop grown in both tropical and subtropical areas of the world for production of sugar, mainly sucrose.

Sucrose is the table sugar consumed by most people all over the world. It is an ingredient for making many medicines and beverages; it is also used as a sweetener in confectionery and related industries [1]. Sugarcane is a perennial plant belongs to the family Poaceae (Grass family); it has jointed fibrous stalks and can grow up to six metres in height. It is cultivated mostly by vegetative method; ensuring that the genotypes are conserved for generations.

India is the second largest producer of sugarcane next to the Brazil in terms of area (48.67 lakh ha) and production (376.91 m.tonnes). In India, Tamil Nadu ranks fourth in area and production next to Uttar Pradesh, Maharastra and Bihar and ranks first in productivity. In Tamil Nadu, it was grown in an area of 1.31 lakh hecters producing 14.12 m.tonnes of sugarcane with a productivity of 107.62 t/ha [2].

Evolution and evaluation of sugarcane clones for different maturity groups is of paramount importance in sugarcane cultivation to get higher recoveries in sugar mills. The proper choice of varieties, season and suitable agronomic practices along with balanced nutrient application play an important role in sugarcane production [3]. Non adoption of any one of the components leads to reduction in sugarcane production which in turn not only affects the cane growers and sugar mills, but also affects adversely the economy of the nation as a whole [4].

The early maturing sugarcane varieties are chosen in the beginning of crushing season for higher sugar recoveries. Besides, the influence of season is less pronounced on early maturing varieties and in late planted conditions, growing of early maturing clones facilitate recovery of higher CCS yield. Hence it is imperative to identify new sugarcane varieties to replace the deteriorating commercial varieties through which the overall productivity could be stabilized. Therefore, to meet the immediate need of sugarcane farmers and sugar factory, there is a need of more number of early maturing, high sugar varieties with high tonnage, good ratooning ability to meet the challenges for improving sugar recovery, especially during the beginning of the crushing season [3]. The objective of this study was to evaluate early maturing sugarcane clones received from different East Coast Centres of India for yield, quality and its contributing traits.

2. MATERIALS AND METHODS

2.1 Experimental Materials and site

The present study were conducted early season of Tamil Nadu during 2015-16 at Sugarcane Research Station, Tamil Nadu Agricultural University, Cuddalore, Tamil Nadu, India (latitude; 11º 46' North; longitude: 79º.46' East; altitude: 4.60 m MSL). The present experiments consist of four experimental trials *viz*., Initial Varietal Trial (IVT), Advanced Varietal Trial (AVT-I), Advanced Varietal Trial (AVT-II) and Advanced Varietal Trial – Ratoon. Initial varietal trial consist of five test clones *viz*., CoA 13321, CoA 13322, CoA 13323, CoA 13324, CoC 13336, CoC 13337, CoC 13338 and CoV 13356 and three standards (Co 6907, CoC 01061 and CoA 92081). In Advanced varietal trial- I, five test clones *viz*., CoA 12321, CoA 12322, CoA 12323, CoOr 12346 and CoV 12356) and three check varieties (Co 6907, CoC 01061 and CoA 92081). In Advanced varietal trial- II (AVT-II) and AVT Ratoon, four test clones (CoA 11321, CoA 11323, CoC 10336 and CoC 11336) and three standards (Co 6907, CoC 01061 and CoA 92081).

2.2 Experimental Layout and Crop Management

All the test clones (Experimental materials) pertaining to the different evaluation trials were planted in Randomized Block Design with three replications during early season in the similar soil type (clay loamy). The plot size was six rows of five meter length spaced at 90 cm with a seed rate of twelve buds per meter. Recommended agronomic practices were followed properly. Need based pest and disease management practices were carried out uniformly throughout the cropping period for maintaining good crop stand.

2.3 Traits Studied and Design

The data recorded during the entire course of study was comprised of the yield and quality parameters. Among these parameters, data on germination per cent and number of tillers (x1000/ha) were recorded at 30^{th} and 120^{th} days after planting respectively, while all other parameters were recorded at harvest. For quality analysis, the cane samples were taken from each clone and juice was extracted by power crusher and analysed for Brix (%) and sucrose (%) as per the method

suggested by [5]. Sucrose per cent was calculated as per Schmitz's tables. CCS% was calculated as per the following formula. CCS% = (Sucrose % - 0.4 (Brix % - Sucrose %)) x 0.75. Then, the CCS yield was determined based on CCS per cent and cane yield. All the collected data were statistically analysed by standard statistical method described by [6].

3. RESULTS AND DISCUSSION

3.1. Initial Varietal Trial (IVT)

In Initial Varietal Trail, eight clones and three standards were evaluated for yield and quality traits. The results are presented in Table 1 and revealed that, the clone CoC 13337 recorded higher CCS yield (17.92 t/ha) followed by the clone CoC 13336 (17.25 t/ha) and clone CoA 13322 (16.53 t/ha). The Cane yield was maximum in the clone CoC 13337 (139.81 t/ha) followed by the clone CoC 13336 (134.26 t/ha) and CoA 13322 (129.59t/ha). The higher CCS yield of sugarcane clones may be attributed to relatively more average cane yield and subsequent commercial cane sugar percentage. There are varieties capable of giving higher cane yields and fairly good recovery leading to higher sugar production [3]. The Brix per cent was maximum in the clone CoC 13336 (20.82%) followed by the clone CoC 13337 (20.62%) and CoA 13324 (20.55%). The sucrose per cent was maximum in the clone CoC 13337 (17.61%) followed by the clone CoC 13336 (17.57%). For CCS per cent, the clone CoC 13336 had higher CCS (12.85%) followed by the clone CoC 13337 (12.82%) and CoA 13322 (12.76%). For single cane weight, it was ranged from 1.35 kgs (CoC 13337) to 1.03kg (CoC 01061). The next better performing entry is CoC 13336, which recorded 1.31 kgs. For stalk length, the clone CoC 13337 expressed higher cane length (277.33 cm) and followed by the clones CoC 13336 (276.11cm) and CoA 13323 (276.11cm). For stalk diameter, the clone CoC 13337 recorded higher cane thickness (3.05 mm) followed by the clone clones CoC 13336 (2.95 mm) and CoA 13322 (2.76 mm). For number of millable cane, the clone CoA 13324 recorded higher number of millable canes (1,21,320) followed by the clones CoC 13337 (1,18,940) and CoA 13323 (1,15,470). For number of tillers, it was ranged from 1,41,010 (CoC 13337) to 1,16,730 (Co 6907). Regarding germination per cent, maximum germination per cent was recorded by standard CoC 01061

(62.29%) followed by the clone CoA 13322 (58.45%) and minimum recorded by the clone CoA 13324 (43.70%). Number of millable cane directly influences cane yield as it is the combined interaction of germination and tillering ability [7].

3.2 Advanced Varietal Trial- I plant (AVT-I)

In AVT-I plant trial, the results are presented in Table 2. The clone CoA 12322 recorded the higher cane yield (126.70t/ha) followed by the clone CoA 12321 (123.23t/ha) and CoA 12323 (122.13t/ha). The CCS yield was maximum in the clone CoA 12322 (15.92 t/ha) followed by the clone CoOr 12346 (15.54t/ha) and CoA 12323 (15.46t/ha). The CCS per cent was maximum in CoOr 12346 (12.75%) followed by the standard CoC 01061 (12.68%) and CoA 12323 (12.65%). The similar reports, on evaluation of early maturing sugarcane clones for cane yield and CCS yield was already reported by [8]. The clone CoOr 12346 recorded higher sucrose (17.87%) followed by the standard CoC 01061 (17.74%) and the clone CoA 12323 (17.66%). Single cane weight is the product of its length, girth and contributes substantially towards final cane yield. For this trial, ranged from 1.01 kg (CoC 01061) to 1.55 kgs (CoOr 12346). For stalk length, the clone CoA 12322 recorded higher cane length (295.67cm) followed by the Clone CoA 12321 (290.67cm) and the clone CoC 01061 (275.67cm). The stalk diameter was maximum in the clone CoOr 12346 (2.85cm) and followed by the clone CoA 123321(2.80cm) and CoA 12322 (2.77cm). The similar work was already reported by [9]. For number of millable cane, the standard CoC 01061 recorded higher value (1,16,520 /ha) followed by the Clone CoOr 12346 (1,13,480/ha) and Co 6907 (1,06,820/ha). For Number of tillers, the standard CoC 01061 recorded higher number of tillers (1,43,890/ha) followed by the Clone CoOr 12346 (1,36,090 /ha) and CoA 12321 (1,32,430 /ha). The germination per cent was ranged from 46.72% to 72.46% expressed by the clones CoA 12323 and CoOr 12346 respectively.

3.3 Advanced Varietal Trial Plant-II (AVT-II)

The performance of four clones and three standards were evaluated yield and quality traits and results are furnished in Table 3. The clone CoC 11336 registered the higher cane yield (139.25 t/ha) followed by the CoC 10336 (123.34 t/ha) and CoA 11323 (120.60t/ha). The CCS yield was maximum in CoC 11336 (17.83t/ha) followed by CoC 10336 (15.39 t/ha) and CoA 11323 (15.26 t/ha). The sucrose content was maximum in the clone CoC 11336 (17.62 %) followed by CoC 01061 (17.48%) and

clone CoA 11321 (17.44%). The sucrose per cent is useful in deciding the quality of sugarcane and it influences the sugar recovery and sugar production in sugar mills. The results are almost same as demonstrated by [10].

The CCS per cent was maximum in CoC 11336 (12.81%) followed by the clone CoA 11321(12.78%) and standard CoC 01061 (12.77%). For Brix percentage was high in the clone CoC 11336 (20.05) and followed by the standard CoC 01061 (20.03%) and CoA 11321 (20.00%). For single cane weight, the Clone CoC 11336 (1.42kg) recorded higher value followed by the CoC 10336 (1.34kg) and CoA 11321 (1.26kg). For stalk length, the clone CoC 11336 recorded maximum cane length (297.33 cm) followed by the entry CoC 01061 (275.33 cm) and CoC 10336 (275.00 cm). In stalk diameter, the clone CoC 11336 recorded highest value of stalk diameter (3.11 cm) followed by the clone CoC 10336 (2.93 cm) and CoA 10336 (2.85cm). For number of millable cane, the standard CoC 01061 recorded highest number of millable cane (1,28,970/ha) followed by the clone CoC 11336 (1,23,690/ha) and CoC 10336 (1,20,610/ha). For number of tillers, the standard CoC 01061 recorded higher number of tillers cane (1,45,000/ha) followed by the clone CoC 11336 (1,42,640/ha) and CoC 10336 (1,37,500/ha). The germination per cent in this trial, ranged from 50.28 (CoA 92081) to 71.89% recorded by the standard CoC 01061. This Assessment of clones is in agreement with the finding of [3] & [11].

3.4. Advanced Varietal Trial (Early) – Ratoon

AVT-I plant was maintained as ratoon crop after harvesting of AVT I plant. Among the test clones in ratoon crop, the clone CoC 11336 registered the higher cane yield (134.43 t/ha) followed by the clone CoC 10336 (121.33 t/ha) and CoA 11323 (118.42t/ha). The CCS yield was maximum in CoC 11336 (17.27t/ha) followed by the same clone CoC 10336 (15.25 t/ha) followed by CoA 11323 (14.97 t/ha). The sucrose content was maximum in the clone CoC 11336 (17.70 %) followed by the clone CoA 11321 (17.51 %) and check variety CoC 01061 (17.50 %). For single cane weight ranged from 0.90kg (Co 6907) to 1.46 kgs (CoC 11336). For stalk length, the clone CoC 11336 recorded maximum cane length (291.00cm) followed by the entry CoC 10336(282.67 cm) and CoC 01061 (275.62 cm). In stalk diameter, the clone CoC 11336 recorded highest value of cane diameter (2.96cm) followed by the clone CoC 10336 (2.84cm) and CoA 11323 (2.78cm). For number of millable cane,

the standard variety CoC 01061 recorded highest number of millable cane (1,25,150/ha) followed by the clone CoC 10336 (1,18,400/ha) and CoC 11336 (1,17,470/ha). For number of tillers, the standard CoC 01061 recorded higher number of tillers cane (1,41,780/ha) followed by the clone CoC 11336 (1,41,680/ha) and CoC 10336 (1,38,490/ha). The similar results on evaluation of sugarcane clones for yield and quality traits already reported by [12].

4. CONCLUSION

Identification of promising sugarcane clones that, besides having desirable characteristics, exhibit high sugar content is an important aspect in sugarcane breeding. Sugar recovery stands the factor of prime importance both from millers and breeding point of view. On the basis of overall performance of different clones evaluated, the test clones *viz*., CoC 13336 and CoC 10336 (in Initial varietal trial), CoA 12322 and CoA 12321 (in Advanced Varietal Trial); the clones CoC 11336 and CoC 10336 (in AVT II and Ratoon) were exhibited better performance in terms of cane yield, quality and its contributing traits. Hence it was suggested that the selected sugarcane clones could be evaluated in further breeding trials for confirmation and the best promising clone could be released as a new sugarcane variety for early season of Tamil Nadu.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

REFERENCES

1. Macauley Asim Ittah and Ekemini Edet Obok. Breeding Potential and Multivariate Analyses of Morphological and Yield Traits in Industrial Sugarcane (*Saccharum officinarum* L.) Accessions in a Humid Tropical Agroecology. International Journal of Plant & Soil Science. 2019. 7(5): 1-10.

2. Sugarcane Statistics- India, 2020. *https://www.statista.com*

3. Ganapathy, S. and Purushothaman, R.S. Evaluation and identification of high yielding and high quality early maturing sugarcane clones suitable for East Coast Zone. *Advances in life Sciences.* 2016. 5(11): 4555-4559.

4. Prasada Rao, K., Charumathi, M. and Naidu, N.V. A 128 – A Promising early maturing sugarcane clone suitable for Andhra Pradash. Sugar Journal 2011 – 41st Annual Convention of SISSTA. 1 – 4.

5. Meade, C.P. and Chen, J.C.P. Cane sugar hand book. 1977. 10th Edn. John Wiley & Sons Inc, New York.

6. Panse, V.G. and Sukhatme, P.V. Statistical methods for Agricultural Workers. 1978. ICAR, New Delhi.

7. Shanmuganathan, M., Annadurai, K., Nageswari, R and Asokan. M. Evaluation of sugarcane clones for quantitative yield and quality characters in AICRP trials for early season. Electronic J. of Plant Breeding. 2015. 6(1): 292-297.

8. Ganapathy, S. and Purushothaman, R.S.. Performance of Promising Early Maturing Sugarcane Clones for Yield and Quality Traits during Varietal Development Process. *Electronic Journal of plant Breeding and Genetics.* 2017. 8(1): 279 - 282.

9. Sabitha, N. and Prasada Rao, K. Promising high yielding and sucrose rich early maturing sugarcane clones for Andhra Pradesh. Sugar Journal 2008 – 39th Annual convention of SISSTA. 2008. 11 - 14.

10. Hapase, R.S., Talekar, S.D., Repale, J.M. and Doule, R.B. Sugar productivity assessment of early maturing sugarcane genotypes in Peninsular India. Sugar Journal 2013 – 43rd Annual Convention of SISSTA, 2013. 29-33.

11. Panhwar, R.N., Chohan, M., Panhwar, D.B., Memon, M.A., Memon, Y.M. and Panhwar,M.A.. Relative cane yield and quality appraisal of divergent sugarcane clones in 4th cycle under Thatta climatic conditions. Pak. Sugar Journal. 2008. 23(1): 15-20.

12. Ganapathy, S., Ravichandran, V**.** and Purushothaman, R.S. Evaluation of promising sugarcane clones for cane yield, sugar yield and resistance to red rot disease in zonal varietal trial. Trends in Biosciences. 2017. 10 (15): 2686-2689.

Table 1. Performance of early clones for yield and quality traits in Initial Varietal Trial (IVT)

S. No.	Clone	Germination (%)	No. of tillers (X1000/ha)	NMC (x1000/ha)	Stalk Length (CM)	Stalk Diameter (cm)	Single Cane Wt. (Kg)	Cane. Yield (t/ha)	Brix (%)	Sucrose (%)	CCS (%)	CCS Yield. (t/ha).
1	CoA 13 321	51.76	130.39	113.38	265.33	2.64	1.13	121.09	19.91	16.82	12.42	15.05
2	CoA 13 322	58.45	138.33	113.80	272.67	2.74	1.27	129.59	20.37	17.42	12.76	16.53
3	CoA 13 323	48.37	136.20	115.47	276.11	2.72	1.22	128.93	20.43	17.45	12.62	16.28
4	CoA 13 324	43.70	136.41	121.32	275.00	2.76	1.17	127.48	20.55	17.49	12.74	16.24
5	CoC 13 336	51.33	134.29	106.93	276.11	2.95	1.31	134.26	20.82	17.54	12.85	17.25
6	CoC 13 337	55.77	141.01	118.94	277.33	3.04	1.35	139.81	20.62	17.61	12.82	17.92
7	CoC 13 338	44.23	118.09	98.52	260.45	2.50	1.13	112.79	20.43	17.40	12.50	14.11
8	CoV 13 356	44.82	136.24	112.68	255.62	2.55	1.26	126.86	20.28	17.13	12.42	15.75
	Standard											
1	Co 6907	53.43	116.73	93.88	253.33	2.25	1.15	105.41	19.64	16.92	12.42	13.09
2	CoC 01061	62..29	136.72	113.65	272.33	2.43	1.03	113.93	20.51	17.52	12.73	14.50
3	CoA 92081	50.99	118.49	97.62	251.83	2.58	1.22	117.50	20.24	17.31	12.61	14.81
	CD (0.05%)	7.59	14.10	13.09	14.44	0.20	0.14	10.57	0.33	0.40	0.20	1.36
	CV (%)	8.69	6.31	7.00	3.18	4.34	6.86	5.03	0.95	1.36	0.92	5.14

Table 2. Performance of early clones for yield and quality traits in Advanced Varietal Trial- I (AVT- I)

S. No.	Clone	Germina-tion (%)	No. of tillers (x1000/ha)	NMC (x1000/ha)	Stalk Length (cm)	Stalk Diameter (cm)	Single Cane Wt. (kg)	Cane Yield (t/ha)	Brix (%)	Sucrose (%)	CCS (%)	CCS Yield. (t/ha).
1	CoA 12321	52.72	132.43	104.95	290.67	2.80	1.31	123.23	20.53	17.26	12.53	15.45
2	CoA 12322	53.58	129.11	98.36	295.67	2.77	1.51	126.70	20.39	17.33	12.56	15.92
3	CoA 12323	46.72	125.57	98.45	273.33	2.75	1.35	122.13	20.71	17.66	12.65	15.46
4	CoOr 12346	67.82	136.09	113.48	274.33	2.85	1.55	121.88	20.25	17.87	12.75	15.54
5	CoV 12356	53.89	127.05	95.88	272.33	2.71	1.37	119.38	21.14	17.39	12.62	15.06
	Standard											
1	Co 6907	67.37	125.26	106.82	263.67	2.62	1.10	98.12	19.67	16.77	11.87	11.66
2	CoC 01061	72.46	143.89	116.52	275.67	2.36	1.01	108.30	20.90	17.74	12.68	13.73
3	CoA 92081	52.12	115.42	92.51	261.67	2.63	1.27	114.82	20.42	17.16	12.47	14.32
	CD (0.05%)	12.02	14.49	14.92	18.31	0.17	0.19	10.64	0.44	0.51	0.24	1.31
	CV (%)	11.90	6.47	6.14	3.83	3.72	8.28	5.27	1.27	1.69	1.09	5.18

Table 3. Performance of early clones for yield and quality traits in Advanced Varietal Trial – II (AVT-II)

S. No.	Clone	Germina-tion (%)	No. of tillers (x1000/ha)	NMC (x1000/ha)	Stalk Length (cm)	Stalk Diameter (cm)	Single Cane Wt. (kg)	Cane Yield (t/ha)	Brix (%)	Sucrose (%)	CCS (%)	CCS Yield. (t/ha).
1	CoA 11321	50.31	136.27	103.65	265.67	2.72	1.26	115.34	20.00	17.44	12.78	14.73
2	CoA 11323	57.18	135.75	102.25	272.67	2.85	1.21	120.60	19.98	17.42	12.65	15.26
3	CoC10336	70.86	137.50	120.61	275.00	2.93	1.34	123.34	19.77	17.21	12.48	15.39
4	CoC 11336	68.70	142.64	123.69	297.33	3.11	1.42	139.25	20.05	17.62	12.81	17.83
	Standard											
1	Co 6907	67.18	122.81	99.63	255.33	2.63	0.98	100.38	19.17	17.02	11.96	12.00
2	CoC 01061	71.89	145.00	128.97	275.33	2.48	0.99	111.91	20.03	17.48	12.77	14.29
3	CoA 92081	50.28	117.60	100.06	259.33	2.66	1.23	112.93	19.93	17.10	12.37	13.97
	CD (0.05%)	8.41	13.07	12.56	19.86	0.18	0.13	9.52	0.46	0.29	0.36	1.29
	CV (%)	7.59	5.56	6.34	4.11	3.7	6.25	4.55	1.32	0.93	1.62	5.07

Table 4. Performance of early clones for yield and quality traits in Advanced Varietal Trial – Ratoon (AVT-R)

S. No.	Clone	No. of tillers (x1000/ha)	NMC (x1000/ha)	Stalk Length (cm)	Stalk Diameter (cm)	Single Cane Wt. (kg)	Cane Yield (t/ha)	Brix (%)	Sucrose (%)	CCS (%)	CCS Yield. (t/ha).
1	CoA 11321	130.34	105.64	263.33	2.67	1.32	114.70	19.83	17.51	12.62	14.47
2	CoA 11323	134.80	100.77	273.00	2.78	1.31	118.42	20.07	17.44	12.64	14.97
3	CoC10336	138.49	118.40	282.67	2.84	1.38	121.33	19.97	17.26	12.57	15.25
4	CoC 11336	141.68	117.47	291.00	2.96	1.46	134.43	20.43	17.70	12.84	17.27
	Standard										
1	Co 6907	116.73	101.39	261.00	2.44	0.96	97.23	19.17	17.13	12.13	11.80
2	CoC 01061	141.78	125.15	275.67	2.38	1.05	104.94	20.17	17.50	12.75	13.38
3	CoA 92081	116.75	96.18	255.33	2.65	1.23	103.35	20.00	17.25	12.56	12.98
	CD (0.05%)	13.60	10.90	16.28	0.21	0.16	8.59	0.42	0.28	0.31	1.02
	CV (%)	5.81	5.61	3.37	4.34	7.39	4.25	1.2	0.91	1.37	1.01