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# **Research Article**

# Co 12009: Midlate sugarcane variety for tropical India

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#### Abstract

Co 12009 was identified by ICAR-Sugarcane Breeding Institute, Coimbatore as a high yielding and midlate maturing variety which was selected from the cross of [{(Co 7201 x (Co 62174 x SES 91)} x Co 88037)}] x Co 62198. The variety was approved in the 83<sup>rd</sup> meeting of the Central Sub Committee on Crop standards, Notification and released for cultivation as a midlate variety in the States of Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Tamil Nadu and Telangana of Peninsular Zone. It has SES 91 (*S. spontaneum*) as a genetic base and is a product of three nobilized generations. It performed well in All India Coordinated Research Project AICRP(S) trials conducted across the centres of Peninsular zone for cane yield, sugar yield and sucrose % with an overall mean of 119.65 t/ha of cane yield, 17.31 t/ha of commercial cane sugar, 19.91 per cent of juice sucrose at 360 days of harvest in comparison with midlate standard Co 86032. It is an excellent ratooner with an improvement of 13.70 and 10.43 per cent for sugar and cane yield, respectively over Co 86032 and also performed well under 125 % RDF (recommended dose of fertilizer) condition and wide row spacing for cane yield and it was superior to all the three standards *viz.*, CoC 671, Co 86032 and CoSnk 05103. It is resistant to red rot and proved its wide adaptability in varied environments and also a promising donor for drought. Co 12009 is viewed as a potential midlate variety and is expected to produce higher cane and sugar yield in the states of Peninsular zone.

Keywords: Co 12009, Midlate variety, Cane yield, sugar yield, Sugar cane

### INTRODUCTION

In sugarcane cane, yield is an important character and varieties play an important role in sugarcane production and its sustainability. New varieties with high yield coupled with good quality and well suited for varied environments and different maturity phases are identified and are a continuous process. Intermittent and prolonged drought is observed in farmer's fields due to irregular rainfall patterns and hence clones that exhibit tolerance to low moisture levels are more desirable. Varietal development based on the evaluation of different genotypes under varying environmental conditions is essential to select high-yielding and stable varieties. There is a need to identify high -yielding new crop varieties adapted to the varying ecological and climatic conditions. The varietal improvement programme at the ICAR -Sugarcane Breeding Institute, Coimbatore, is focused in developing superior varieties with the potential to increase sugar

yield and combining high cane yield, sucrose content and resistance to pests and diseases. Efforts are continuously being made to identify alternate sugarcane varieties that combine diverse background, high yield and varied adaptability with wide performance to the changing climatic/ecological conditions through multilocation testing to improve the productivity in tropical India. The midlate maturing sugarcane variety Co 12009, is a variety with a new genetic base of SES 91 (*S.spontaneum*) identified through multilocation testing in the tropical zone of India that combines high yield and quality in comparison with Co 86032 at twelve months of age indicating its potential as a high yielding variety with wide adaptability under varied environments and red rot resistance.

### MATERIALS AND METHODS

Co 12009 was identified through hybridization and



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selection of the cross [{(Co 7201 x (Co 62174 x SES 91)} x Co 88037)}] x Co 62198 of which SES 91 clone is a new genetic base involving S. spontaneum. It is the nobilized third back cross product of F1 hybrid involving Co 62174 and SES 91 and crossed with viz., BGC 25021, Co 7201, Co 88037 and Co 62198 at three stages of nobilisation. The clone was evaluated in the ground nursery at ICAR-Sugarcane Breeding Institute, Research Centre, Agali and in subsequent clonal stages at ICAR- SBI, Coimbatore for yield and quality parameters during the period of 2006-2012. The clone was tested in Initial Varietal Trial (IVT) (2015-16) under the All India Coordinated Research Project on Sugarcane [AICRP(S)] in 14 centres of Peninsular India and promoted to advanced Varietal Trial (AVT) testing (2017-2019) in major tropical regions of sugarcane (Coimbatore, Akola, Basmathnagar, Kolhapur, Mandya, Navsari, Padegaon, Perumalapalle, Powerkheda, Pravaranagar, Pugalur, Pune, Sameerwadi, Sankeshwar and Thiruvalla centres). The trials were laid out in randomized block design (RBD) replicated thrice with a plot size of eight rows of 6 m length spaced 90 cm apart. Normal cultural practices were followed and plant protection measures were carried out to raise a healthy crop (Sundara, 1998). Observations were recorded at 300 and 360 days on the number of millable canes ('000/ ha), cane thickness (cm), cane height (cm), single cane weight (kg), CCS (t/ha) and cane yield (t/ha) at 360 days. Quality parameters (Brix %, Sucrose% and CCS %) were recorded at 300 and 360 days. The red rot reaction of this clone was evaluated under natural and artificial conditions with predominant red rot causing pathotype in the Peninsular region. Statistical analysis was carried out using a standard procedure (Singh and Chaudhary, 1985). The genealogy of Co12009 is given below.

# **RESULTS AND DISCUSSION**

AVT (Two plant and one ratoon crops) were conducted in 14 centres of the Peninsular zone during 2017-2019. Co 12009 recorded 119.65 t/ha of cane yield, 17.31 t/ha of commercial cane sugar, 19.91 per cent of juice sucrose and 15.47 per cent of pol in the cane at 360 days of harvest (**Table 1**) and topped in 18 and 21 trials compared to all the standards for cane yield (t/ha) and sugar yield (t/ha), respectively. Co 12009 recorded an average CCS

yield of 17.31 t/ha from three crops (2P+1R) with an overall improvement of 10.40, 18.08 and 15.32 per cent for sugar yield over the best midlate standard Co 86032 (15.68 t/ha) and early standard varieties *viz.*, CoC 671 (14.66 t/ha) and CoSnk 05103 (15.04 t/ha) from 21 trials. Co 12009 with an overall mean cane yield of 119.65 t/ha showed an improvement of 9.03, 23.42 and 7.92 per cent in comparison with the standards Co 86032 (109.73 t/ha), CoC 671 (96.93 t/ha) and CoSnk 05103 (110.85 t/ ha), respectively (**Table 2 and Table 3**).

Co 12009 was the best entry in the ratoon trials with an improvement of 13.70 and 10.43 per cent for sugar and cane yield, respectively over Co 86032. It recorded 30.11 and 34.19 per cent improvement for sugar and cane yield, respectively over the early standard CoC 671.

Out of 33 locations tested, Co 12009 topped in 10 centres for juice sucrose % and 15 locations for Pol % cane. Co 12009 recorded 19.91 sucrose per cent with an improvement of 1.80 and 6.99 per cent over the midlate standard Co 86032 and early standard CoSnk 05103, respectively (Table 1). In ratoon crop, the entry showed an improvement of 2.52 and 8.07 per cent over the standards checks Co 86032 and CoSnk 05103, respectively. This entry performed well across the zone for cane and sugar yield, sucrose % and pol % cane. Among the 14 locations tested, Co 12009 topped in Padegaon, Basmathnagar and Perumallapalle for juice sucrose % and CCS %. Co 12009 ranked first in five locations for Pol % cane. It recorded juice sucrose of 17.46 per cent at 300 days in comparison with Co 86032 (17.35 %) and CoSnk 05103 (16.34 %) with an improvement of 0.61 and 6.86 per cent over the checks, respectively.

The mean Pol% in cane in Co 12009 was 15.47 per cent which was 2.25 and 6.84 per cent improvement over the zonal standards Co 86032 and CoSnk 05103, respectively. It showed a 1.97 per cent improvement in Pol % in cane over the qualifying variety CoM 12085 (15.17 %). The entry recorded a mean CCS of 14.10 per cent across the zone with an overall improvement of 2.28 and 7.35 per cent over Co 86032 and CoSnk 05103, respectively.



Table 1. Performance of Co 12009 (2P+1R) across 14 centres in Peninsular zone in advanced varietal trials (2017-2019) at 360 days

Entries/ Standards	CCS (t/ha)	Cane yield (t/ha)	Sucrose %	CCS %	Purity %	Pol % in cane	Cane diameter (cm)	Cane length (cm)	Single cane weight (kg)	NMC ooo/ha
Co 12009	17.31	119.65	19.91	14.10	92.50	15.47	2.81	294.36	1.17	93.02
Co 86032	15.68	109.73	19.55	13.79	91.87	15.13	2.81	252.66	0.98	97.70
CoC 671	14.66	96.93	20.81	14.78	93.22	16.20	2.81	251.83	1.01	84.30
CoSnk 05103	15.04	110.85	18.61	13.14	91.11	14.48	2.48	282.65	0.80	115.43
% improvement over Co 86032	10.40	9.03	1.80	2.28	0.68	2.25	-0.02	16.50	19.19	-4.79
% improvement over CoC 671	18.08	23.42	-4.30	-4.57	-0.77	-4.51	-0.18	16.89	15.58	10.34
% improvement over CoSnk 05103	15.32	7.92	6.99	7.35	1.52	6.84	13.13	4.14	46.78	-19.41

In Coimbatore, Co 12009 recorded a cane yield of 119.60 t/ha with an improvement of 21.60 per cent against Co 86032 (98.36 t/ha). It recorded a sugar yield of 17.05 t/ ha in comparison with standard checks Co 86032 (13.78 t/ha), CoC 671 (13.80 t/ha) and CoSnk 05103 (14.74 t/ ha) and showed an increase of 23.68, 23.56 and 15.65 per cent for sugar yield, respectively. In Padegaon, it recorded a sugar yield of 20.21 t/ha with an improvement of 11.64 and 9.62 per cent over CoC 671 and CoSnk 05103, respectively (**Table 2 and Table 3**).

Co 12009 performed well in Navsari, Padegaon, Pravaranagar, Perumallapalle, Kolhapur and Sankeshwar centres for cane and sugar yield. It performed well for juice sucrose % in Coimbatore, Padegaon, Kolhapur, Pune, Rudrur, Sankeshwar and Thiruvalla.

It recorded an overall improvement (2P+1R) of 9.48, 27.14, 28.47 and 19.16 per cent for cane yield over popular variety Co 86032 in Kolhapur, Navsari, Perumallapalle and Sankeshwar centres, respectively.

Co 12009 has the ideal plant characters of very tall, erect, thick canes and early fast growth with high tillering ability. The clone possesses tall canes of 294.36 cm in length. It recorded 16.50 per cent improvement for cane height over Co 86032 and 16.89 per cent over CoC 671. Single cane weight, the major component of yield trait was high which ranged from 1.21 kg (Rudrur) to 2.06 kg (Pravaranagar) and recorded an improvement of 19.19 per cent over Co 86032 (Table 1). Under wide row spacing of 120 cm between rows, Co 12009 recorded a cane yield of 158.83 t/ha with an improvement of 16.24, 11.61 and 10.41 per cent over CoC 671, Co 86032 and CoSnk 05103, respectively. The clone performed well under 125 % RDF (recommended dose of fertilizer) condition for cane yield and it was superior to standards viz., CoC 671, Co 86032 and CoSnk 05103 with an improvement of 11.50, 4.50 and 5.76 per cent, respectively (Table 4).

Identification and release of variety with resistance to new pathological or entomological stresses and improved adaptation to abiotic stresses like drought will have a great impact on sugarcane productivity. This variety with resistance to red rot and adaptation to varied environments is a boon for the Peninsular zone. Co 12009 was MS-MR (Plug) at Coimbatore, Navsari and Thiruvalla centres and resistant (Nodal) to red rot in all centres and smut in all centres except Pune (**Table 5**). However, no natural incidence of smut was observed during the evaluation period. Co 12009 is less susceptible to top borer in Mandya. It was less susceptible to moderately susceptible for early shoot borer, internode borer, mealy bug (except in Padegaon) and scale insect (**Table 6**).

The variety has distinct morphological characters (**Table 7**). It has very tall, erect, thick, greenish wax coated canes with smooth, zigzag, cylindrical to bobbin shaped long internodes, yellow orange growth ring and light yellow dewlap. It is characterized by prominent deep bud grooves, small ovate buds, open tip droopy leaves and a green sheath with very light spines.

The identified midlate variety was compared with Co 86032 for its juice sucrose % and cane yield at 360 days. It combines high yield and quality in comparison with Co 86032 at ten and 12 months of age indicating its potential as a high yielding clone for the tropical zone. Co 12009 possess high and stable yield and better quality characteristics in plant and ratoon crops across the 14 centres of the Peninsular zone in c omparison with the popular variety Co 86032. It combines red rot resistance and would certainly suit cultivation in the Peninsular zone. Co 12009 (THE GAZETTE OF INDIA :3099 4773/G/2020) is viewed as a potential midlate variety and is expected to produce higher cane and sugar yield in the states of the Peninsular Zone.

IPlant         Co 12009         153         14.33         22.57         1603         17.31         12.32         12.93         13.47         20.51         13.14         20.51         11.12         8.47         6.44           C 056022         14.43         8.88         17.31         12.32         11.94         8.55         19.12         16.43         4.75           C 056013         14.53         16.37         17.51         10.36         11.54         13.51         12.32         12.93         14.53         13.4         13.55         16.33         13.4         13.5         23.53         3.44         13.55         16.34         17.51         23.64         13.17         13.05         13.34         10.35         -3.37         2.33         3.64         17.51         23.64         17.51         23.64         17.51         13.64         17.51         23.64         17.51         15.66         14.65         2.44         14.64         14.75         15.66         14.71         15.66         14.71         15.61         13.17         15.65         14.66         17.51         15.61         17.51         15.61         12.61         12.71         15.61         12.61         12.15         12.66         12.16	Crop	Entry	Coim batore	Akola	Basmat hnagar	Kolha pur	Mand ya	Nav sari	Pade gaon	Peruma lapalle	Pravar anagar	Pune	Rud rur	Samee rwadi	Sankes hwar	Thiru valla	Mean
Coorestication         14.43         8.88         17.31         12.32         12.99         20.56         14.66         21.06         13.01         34.73           Cocort1         15.28         10.66         17.715         30.31         31.81         0.355         15.01         19.12         16.33         31.35           % ower Cos6Nt0513         7.35         16.77         30.39         31.60         7.20         41.31         7.22         33.72         25.68           % ower Cos6Nt05103         7.35         16.77         31.60         7.20         47.71         16.74         10.46         47.23         36.4           % ower Cos6Nt05103         7.35         16.73         31.60         7.20         46.11         2.243         -0.31         12.93         17.51         12.64         47.23         36.4           % ower Cos6Nt 05103         14.46         15.86         14.83         15.80         14.43         13.73         13.84         17.77         16.54         14.17         15.91         17.56         16.52         2.44           Cos6Nt 05103         14.44         15.86         14.84         15.86         13.86         17.77         16.54         11.17         12.56         17.56 <td>I Plant</td> <td>Co 12009</td> <td>15.34</td> <td>14.33</td> <td></td> <td>22.57</td> <td>16.03</td> <td>17.30</td> <td>22.71</td> <td>13.47</td> <td>20.51</td> <td>21.12</td> <td>8.67</td> <td>6.44</td> <td>18.15</td> <td>8.95</td> <td>18.15</td>	I Plant	Co 12009	15.34	14.33		22.57	16.03	17.30	22.71	13.47	20.51	21.12	8.67	6.44	18.15	8.95	18.15
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Co 86032	14.43	8.88		17.31	12.32	12.99	20.58	14.69	22.10	19.68	13.08	8.43	12.72	10.72	15.57
CoSink (051(03)         14.29         12.77         17.15         9.32         11.84         18.55         15.03         6.37         18.84         9.75         6.33           % over CoSink (051(03)         7.33         31.95         30.33         31.95         30.33         31.95         30.33         31.95         32.33         31.95         32.33         31.95         32.33         31.95         32.33         31.95         32.33         31.95         32.33         31.95         32.34         41.08         47.73         36.4         47.23         36.4         37.3         31.95         31.95         32.95 </td <td></td> <td>CoC 671</td> <td>15.28</td> <td>10.86</td> <td></td> <td>17.05</td> <td>11.50</td> <td>15.14</td> <td>20.04</td> <td>17.41</td> <td>20.24</td> <td>19.12</td> <td>16.43</td> <td>4.72</td> <td>13.80</td> <td>8.73</td> <td>16.04</td>		CoC 671	15.28	10.86		17.05	11.50	15.14	20.04	17.41	20.24	19.12	16.43	4.72	13.80	8.73	16.04
% over Co 86022         6.31         61.37         30.39         30.11         33.16         10.35         -8.30         -7.19         7.32         -33.72         -23.8           % over Coc 671         0.39         1395         16.37         23.83         33.39         14.27         13.32         22.63         1.33         10.46         -17.3         5.94         1.33         10.46         -17.3         5.94         1.33         10.46         -17.3         5.94         1.33         10.46         -17.3         5.94         1.33         1.41         2.01         1.33         1.41         2.01         1.33         1.41         2.01         1.33         1.41         2.01         1.33         1.41         2.01         1.33         1.41         2.01         1.33         1.41         2.01         1.33         1.41         2.01         1.31         1.41         1.31         1.41         1.31         1.41         1.31         1.41         1		CoSnk 05103	14.29	12.27		17.15	9.32	11.84	18.55	15.03	16.37	18.94	9.75	6.33	12.44	6.76	14.62
% over Coc 671         0.39         3195         32.33         39.39         14.27         13.32         -22.63         1.33         10.46         47.23         36.4           % over Cocs kn (5103)         7.35         16.79         31.60         72.00         46.11         22.43         -10.38         25.29         11.51         -11.08         17.31           % over Coss kn (5103)         7.35         16.79         13.67         14.61         21.91         19.37         15.51         15.20         14.77         21.65         17.71         16.57         13.16         21.92		% over Co 86032	6.31	61.37		30.39	30.11	33.18	10.35	-8.30	-7.19	7.32	-33.72	-23.61	42.69	-16.51	16.57
% over         % over         % over $7.35$ $6.73$ $3.160$ $7.200$ $46.11$ $2.243$ $-10.38$ $25.25$ $11.55$		% over CoC 671	0.39	31.95		32.38	39.39	14.27	13.32	-22.63	1.33	10.46	-47.23	36.44	31.52	2.52	13.13
II Plant         Co 12003         17.31         208         18.33         12.12         17.74         20.66         18.16         19.57         17.55         16.52         17.31         25.3           Co 66032         14.12         3.00         15.20         16.72         14.73         13.67         13.81         13.87         15.90         14.73         13.76         16.57         13.61         13.61         13.61         13.61         13.61         13.61         13.61         13.61         13.61         13.67         13.61         13.65         16.52         14.71         13.61         13.61         13.61         13.61         13.61         13.61         13.61         13.61         13.61         13.71         16.50         14.71         13.61         13.71         16.51         13.61 <t< td=""><td></td><td>% over CoSnk 05103</td><td>7.35</td><td>16.79</td><td></td><td>31.60</td><td>72.00</td><td>46.11</td><td>22.43</td><td>-10.38</td><td>25.29</td><td>11.51</td><td>-11.08</td><td>1.74</td><td>45.90</td><td>32.40</td><td>24.15</td></t<>		% over CoSnk 05103	7.35	16.79		31.60	72.00	46.11	22.43	-10.38	25.29	11.51	-11.08	1.74	45.90	32.40	24.15
Co 86032         14.12         3.00         15.20         14.75         14.75         14.75         16.72         23.4           Coc 671         13.36         1.44         1.387         15.90         14.73         13.77         16.67         13.61         21.6           Coc 671         13.36         1.44         5.80         15.86         14.83         15.86         14.83         15.96         10.77         16.67         13.61         21.6           % over Coc 671         23.06         -5.86         14.83         15.86         19.83         17.77         16.67         13.66         10.7         26.9           % over Coc 671         23.96         13.04         7.28         16.54         -17.72         28.64         19.47         13.65         10.7         76.56         11.97         26.56           % over Coc 671         12.80         14.4         6.18         7.54         11.06         17.71         16.67         17.73         15.66         7.55           Ratoon         Co 12003         15.29         -17.12         28.67         13.26         13.27         17.34         15.06         27.51         17.34         15.06         27.73         26.51         27.51 <t< td=""><td>II Plant</td><td>Co 12009</td><td>17.31</td><td>2.08</td><td>14.88</td><td>18.53</td><td>12.12</td><td>17.74</td><td>20.66</td><td>18.16</td><td>19.55</td><td>16.54</td><td>21.31</td><td>25.91</td><td>17.18</td><td>11.97</td><td>17.84</td></t<>	II Plant	Co 12009	17.31	2.08	14.88	18.53	12.12	17.74	20.66	18.16	19.55	16.54	21.31	25.91	17.18	11.97	17.84
CoC 671         13.36         1.84         13.87         15.90         14.73         13.79         21.31         10.66         17.77         16.50         11.07         26.3           %. over Co86032         22.55         -30.67         -2.11         10.83         -17.89         20.76         -5.18         40.67         0.33         -5.75         28.22         -12.0           %. over Co86032         22.55         -30.67         -2.11         10.83         -17.82         70.52         13.86         -1.37         56.58         19.0           % over Co5 671         29.57         13.04         7.28         16.54         -1.77         28.64         -3.05         70.52         13.86         -1.37         56.58         37.7           % over Co5 671         29.57         13.04         7.28         16.54         17.12         16.47         17.34         15.06         10.4           Co5 671         12.50         17.38         16.42         17.33         16.47         15.36         17.34         15.06         17.34         15.06         17.34         15.06         17.34         15.06         17.34         15.06         17.34         15.06         17.34         15.06         17.34         15.0		Co 86032	14.12	3.00	15.20	16.72	14.76	14.69	21.95	12.91	19.37	17.55	16.62	29.45	17.01	12.53	17.15
CoSIN 05103         14.64         5.80         15.86         14.83         15.86         15.86         15.86         15.86         15.86         15.86         16.57         16.50         11.07         26.9           %. over Co66032         22.59         -30.67         -2.11         10.83         -17.82         26.64         -3.05         7.65         13.95         -5.75         28.22         -12.0           %. over Co66032         22.59         -30.67         -2.11         10.83         -17.72         28.64         -3.05         7.65         13.25         20.54         13.06         13.7         55.56         37.7           %. over Co6 671         29.43         -14.46         -11.33         14.40         11.33         14.42         17.25         15.25         20.54         17.73         15.50         17.13         2557           %. over Co6 6071         12.80         -17.30         14.46         7.54         11.06         12.50         17.13         2551         17.31         2561         17.13         2551         17.31         2561         17.33         2551         17.34         15.00         17.31         17.31         17.31         17.31         17.31         17.31         17.31         <		CoC 671	13.36	1.84	13.87	15.90	14.73	13.79	21.31	10.65	17.17	16.77	13.61	21.61	16.73	12.54	15.54
%. over Co86032         22.59         -30.67         -11         10.83         -17.82         20.76         -5.88         40.67         0.83         -5.75         28.22         -12.0           % over Co6 671         29.57         13.04         7.28         16.54         -17.72         28.64         -3.05         70.52         13.86         -1.37         56.58         19.9           % over Co6 671         29.57         13.04         7.28         16.54         -17.72         28.64         -3.05         70.52         13.86         -1.37         56.58         19.9           % over Co5 nk 05103         18.24         -64.14         -6.18         24.95         -23.53         29.68         19.97         61.42         10.02         0.24         92.50         -3.76           % over Co5 nk 05103         18.24         -5.1         10.22         11.54         16.47         15.38         11.7.3         15.05         11.7.3         15.05         17.13         25.15         71.13         25.15         71.13         25.15         71.33         25.15         71.33         135.1         25.15         11.2.47         15.38         11.2.15         11.2.4         15.06         11.41         17.13         12.5.1		CoSnk 05103	14.64	5.80	15.86	14.83	15.85	13.68	20.26	11.25	17.77	16.50	11.07	26.93	15.88	12.41	15.92
% over CoC 671         29.57         13.04         7.28         16.54         -17.72         28.64         -3.05         70.52         13.86         -1.37         56.58         19.9           % . over CoSnk 05103         18.24         -6.18         24.95         -23.53         29.68         197         61.42         10.02         0.24         92.50         -3.75           % . over CoSnk 05103         18.24         -6.18         24.95         -23.53         29.68         197         61.42         10.02         0.24         92.50         -3.75           Ratoon         Co 12009         18.49         -1         12.80         7.54         11.06         12.95         11.64         18.34         12.50         7.60         10.4           Co 6 671         12.75         -1         10.48         7.54         11.06         12.95         17.34         15.06         17.13         253           % over Co 86032         44.45         -         12.32         14.49         17.54         16.47         15.38         135.1         257         17.34         15.06         17.13         253           % over Co 671         45.02         13.49         15.44         23.72         4.61         53.58 <td></td> <td>%. over Co86032</td> <td>22.59</td> <td>-30.67</td> <td>-2.11</td> <td>10.83</td> <td>-17.89</td> <td>20.76</td> <td>-5.88</td> <td>40.67</td> <td>0.93</td> <td>-5.75</td> <td>28.22</td> <td>-12.02</td> <td>1.00</td> <td>-4.47</td> <td>4.02</td>		%. over Co86032	22.59	-30.67	-2.11	10.83	-17.89	20.76	-5.88	40.67	0.93	-5.75	28.22	-12.02	1.00	-4.47	4.02
%. over CoSnk 05103         18.24         -6.14         -6.18         24.95         -23.53         29.68         1.97         61.42         10.02         0.24         92.50         -3.74           Ratoon         Co 12009         18.49         -6.14         -6.18         24.95         -7.55         15.25         2054         19.54         12.50         7.60           Co 86032         12.80         -         12.82         13.32         11.49         16.47         9.13         21.57         17.34         15.06         10.4           Co 6 671         12.75         -         12.82         13.32         11.49         16.47         9.13         257         17.34         15.06         10.4           Co 6 671         12.75         -         12.82         17.32         14.46         7.33         17.13         257           Co 5 671         15.29         -         -         16.02         15.26         17.34         15.06         17.00           % over Co 5 671         45.05         17.33         17.32         24.14         67.03         4.78         15.06         17.00         27.13         27.70           Mean         Vover Co 5 14.33         14.86         18.40		% over CoC 671	29.57	13.04	7.28	16.54	-17.72	28.64	-3.05	70.52	13.86	-1.37	56.58	19.90	2.69	-4.55	14.80
Ration         Co 12009         18.49         14.40         11.39         14.22         17.25         15.25         20.54         19.54         12.60         7.60           Co 86032         12.80         12.80         12.82         13.32         11.49         16.47         9.13         21.57         17.34         15.06         10.4           Co 6671         12.75         12.80         13.32         11.49         16.47         9.13         21.57         17.34         15.06         10.4           Co 6671         12.75         13.38         16.02         11.54         16.47         9.13         2.57         3.57         3.713         2.57           Vover Co 671         45.02         17.34         15.20         17.34         15.38         17.32         17.33         15.3         3.57           % over Co 671         45.02         17.33         14.49         23.76         4.74         67.03         4.77         2.53         17.00         27.1           % over Co 671         45.02         17.31         14.49         15.46         23.56         4.61         13.63         4.70         2.69         17.00         27.1         27.03         15.703         15.703         15.703		% . over CoSnk 05103	18.24	-64.14	-6.18	24.95	-23.53	29.68	1.97	61.42	10.02	0.24	92.50	-3.79	8.19	-3.55	12.06
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Ratoon	Co 12009	18.49			14.40	11.39	14.22	17.25	15.25	20.54	19.54	12.50	7.60	14.11	8.96	15.77
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Co 86032	12.80			12.82	13.32	11.49	16.47	9.13	21.57	17.34	15.06	10.43	8.73	9.97	13.87
CoSnk 05103         15.29         1.3.38         16.02         11.54         16.49         9.93         17.28         16.47         15.38         13.2           % over Co 86032         44.45         12.32         -14.49         23.76         4.74         67.03         -4.78         12.69         -17.00         -27.1           % over Co 86032         44.45         7.62         -28.90         23.72         4.61         53.58         18.87         18.64         -18.73         -42.7           % over Co 6671         45.02         7.62         -28.90         23.22         4.61         53.58         18.87         18.64         -18.73         -42.7           % over Co 5nk 05103         20.93         7.62         -28.90         23.22         4.61         53.58         18.87         18.64         -18.73         -42.7           Mean         Co 12009         17.06         14.33         14.86         18.50         13.18         16.42         20.21         15.63         27.03         195.7           Mean         Co 12009         17.16         14.33         14.86         18.50         13.47         16.91         25.93         20.20         19.07         16.91         25.16           <		CoC 671	12.75			10.48	7.54	11.06	12.95	11.64	18.34	12.63	17.13	2.57	6.68	8.41	12.12
% over Co 86032         4145         12.32         -14.49         23.76         4.74         67.03         4.78         12.69         -17.00         -27.13           % over Co 671         45.02         37.40         51.06         28.57         33.20         31.01         12.00         54.71         -27.03         195.7           % over Co 671         45.02         7.62         -28.90         23.22         4.61         53.58         18.87         18.64         -18.73         42.7           % over Co Snk 05103         20.93         7.62         -28.90         23.22         4.61         53.58         18.87         18.64         -18.73         42.7           % over Co Snk 05103         13.78         14.88         18.50         13.18         16.42         20.21         15.63         20.07         19.07         16.91         25.9           P = 10         *         13.78         18.88         15.20         15.44         13.06         12.63         20.20         19.07         16.91         25.94           mean         Co 86032         13.88         15.20         15.62         13.43         18.10         13.23         18.10         15.42         21.61         15.12         21.61		CoSnk 05103	15.29			13.38	16.02	11.54	16.49	9.93	17.28	16.47	15.38	13.27	11.32	9.12	14.31
% over CoC 671         45.02         37.40         51.06         28.57         33.20         31.01         12.00         54.71         -27.03         195.7           % over CoSnk 05103         20.93         7.62         -28.90         23.22         4.61         53.58         18.87         18.64         -18.73         42.7           % over CoSnk 05103         20.93         7.62         -28.90         23.22         4.61         53.58         18.87         18.64         -18.73         42.7           Mean         Co 12009         17.05         14.33         14.88         18.50         13.18         16.42         20.21         15.63         18.77         16.91         25.9           2P+1R         *Weighted         13.78         14.88         18.50         13.17         15.63         20.20         19.07         16.91         25.9           2P+1R         *Weighted         13.80         16.87         14.48         11.26         13.47         13.06         19.67         16.91         25.94         29.4           Mean         Coc 671         13.80         10.86         13.87         14.48         11.26         13.23         18.10         18.19         16.17         15.34         21.6		% over Co 86032	44.45			12.32	-14.49	23.76	4.74	67.03	-4.78	12.69	-17.00	-27.13	61.63	-10.13	13.67
% over CoSnk 05103         20:33         7.62         -28:90         23:22         4.61         53:58         18:87         18:64         -18.73         -42.73           2P+1R         *Weighted         17.05         14.33         14.88         18:50         13:18         16.42         20.21         15.63         20.20         19:07         16:91         25:9           2P+1R         *Weighted         17.05         14.33         14.88         18:50         13:18         16:42         20.21         15.63         20.20         19:07         16:91         25:9           2P+1R         *Weighted         13.78         8.88         15.20         15.62         13.47         13:06         19:67         12.24         21:01         18:19         15:84         29:4           Mean         Coc 671         13:80         10:86         15.12         15.62         13.47         13:06         19:67         17:14         17:30         13:23         26:9           Coc 671         13:80         61:37         -2.11         18:46         -1.23         16:17         15:37         21:6           % over Co86032         23:68         61:37         21:33         12:07         17:14         17:30		% over CoC 671	45.02			37.40	51.06	28.57	33.20	31.01	12.00	54.71	-27.03	195.72	111.23	6.54	30.11
Wean 2P+1R         Co 12009         17.05         14.33         14.88         18.50         13.18         16.42         20.21         15.63         20.20         19.07         16.91         25.9           2P+1R         *Weighted mean         *Weighted         13.78         8.88         15.20         15.62         13.47         13.06         19.67         12.24         21.01         18.19         15.84         29.4           Co 6671         13.80         10.86         13.87         14.48         11.26         13.33         18.10         13.23         18.16         15.37         21.6           CoS 66032         13.80         10.86         13.87         14.48         11.26         13.33         18.10         13.23         18.17         15.37         21.6           CoS 66032         14.74         12.27         15.86         15.12         13.73         12.07         17.14         17.30         13.23         26.9           % over Co86032         23.68         61.37         -2.11         18.46         -2.13         25.76         27.63         -3.87         4.82         6.72         -12.0           % over Co86032         23.56         31.95         7.28         27.79         23.16<		% over CoSnk 05103	20.93			7.62	-28.90	23.22	4.61	53.58	18.87	18.64	-18.73	-42.73	24.65	-1.12	10.20
Co 86032       13.78       8.88       15.20       15.62       13.47       13.06       19.67       12.24       21.01       18.19       15.84       29.4         CoC 671       13.80       10.86       13.87       14.48       11.26       13.33       18.10       13.23       16.17       15.37       21.6         CoC 671       13.80       10.86       13.87       14.48       11.26       13.33       18.10       13.23       16.17       15.37       21.6         CoShk 05103       14.74       12.27       15.86       15.12       13.73       12.35       18.43       12.07       17.14       17.30       13.23       26.9         % over Co860032       23.56       31.95       7.28       27.79       17.09       23.18       11.64       18.09       8.70       17.89       9.99       19.9         % over CoC 671       23.56       31.95       7.28       27.79       17.09       23.18       11.64       18.09       8.70       17.89       9.99       19.9         % over CoC 671       23.56       16.19       22.35       -4.01       32.29       9.62       29.47       17.85       10.19       27.83       -3.7       77.83       3.7 <td>Mean 2P+1R</td> <td>Co 12009 *Weighted mean</td> <td>17.05</td> <td>14.33</td> <td>14.88</td> <td>18.50</td> <td>13.18</td> <td>16.42</td> <td>20.21</td> <td>15.63</td> <td>20.20</td> <td>19.07</td> <td>16.91</td> <td>25.91</td> <td>16.48</td> <td>11.97</td> <td>17.31*</td>	Mean 2P+1R	Co 12009 *Weighted mean	17.05	14.33	14.88	18.50	13.18	16.42	20.21	15.63	20.20	19.07	16.91	25.91	16.48	11.97	17.31*
CoC 671       13.80       10.86       13.87       14.48       11.26       13.33       18.10       13.23       18.58       16.17       15.37       21.6         CoShk 05103       14.74       12.27       15.86       15.12       13.73       12.35       18.43       12.07       17.14       17.30       13.23       26.9         % over Co86032       23.66       61.37       -2.11       18.46       -2.13       25.76       2.75       27.63       -3.87       4.82       6.72       -12.0         % over Co86032       23.56       31.95       7.28       27.79       17.09       23.18       11.64       18.09       8.70       17.89       9.99       19.9         % over CoC 671       23.56       31.95       7.28       27.79       17.09       23.18       11.64       18.09       8.70       17.89       9.99       19.9         % over CoShk 05103       15.65       16.79       -6.18       22.35       -4.01       32.92       9.62       29.47       17.85       10.19       27.83       -3.77		Co 86032	13.78	8.88	15.20	15.62	13.47	13.06	19.67	12.24	21.01	18.19	15.84	29.45	12.82	12.53	15.68*
CoShk 05103       14.74       12.27       15.86       15.12       13.73       12.35       18.43       12.07       17.14       17.30       13.23       26.91         % over Co86032       23.68       61.37       -2.11       18.46       -2.13       25.76       27.5       -3.87       4.82       6.72       -12.0         % over Co86032       23.56       31.95       7.28       27.79       17.09       23.18       11.64       18.09       8.70       17.89       9.99       19.9         % over CoC 671       23.56       31.95       7.28       27.79       17.09       23.18       11.64       18.09       8.70       17.89       9.99       19.9         % over CoShk 05103       15.65       16.79       -6.18       22.35       -4.01       32.92       9.62       29.47       17.85       10.19       27.83       -3.7		CoC 671	13.80	10.86	13.87	14.48	11.26	13.33	18.10	13.23	18.58	16.17	15.37	21.61	12.40	12.54	14.66*
% over Co86032 23.68 61.37 -2.11 18.46 -2.13 25.76 2.75 27.63 -3.87 4.82 6.72 -12.0 % over CoC 671 23.56 31.95 7.28 27.79 17.09 23.18 11.64 18.09 8.70 17.89 9.99 19.9 % over CoSnk 05103 15.65 16.79 -6.18 22.35 -4.01 32.92 9.62 29.47 17.85 10.19 27.83 -3.7′		CoSnk 05103	14.74	12.27	15.86	15.12	13.73	12.35	18.43	12.07	17.14	17.30	13.23	26.93	13.21	12.41	15.04*
% over CoC 671 23.56 31.95 7.28 27.79 17.09 23.18 11.64 18.09 8.70 17.89 9.99 19.9 % over CoSnk 05103 15.65 16.79 -6.18 22.35 -4.01 32.92 9.62 29.47 17.85 10.19 27.83 -3.7		% over Co86032	23.68	61.37	-2.11	18.46	-2.13	25.76	2.75	27.63	-3.87	4.82	6.72	-12.02	28.55	-4.47	10.40
% over CoSnk 05103 15.65 16.79 -6.18 22.35 -4.01 32.92 9.62 29.47 17.85 10.19 27.83 -3.7		% over CoC 671	23.56	31.95	7.28	27.79	17.09	23.18	11.64	18.09	8.70	17.89	9.99	19.90	32.87	-4.55	18.08
		% over CoSnk 05103	15.65	16.79	-6.18	22.35	-4.01	32.92	9.62	29.47	17.85	10.19	27.83	-3.79	24.72	-3.55	15.32

Table 2. Performance of Co 12009 in Peninsular zone for CCS (t/ha)

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I Plant       Co 12009         Co 86032       Co 86032         CoC 671       CoSnk 05103         % over Coc 67       % over Coc 67         % over Coc 67       % over Coc 67         % over Coc 671       Coc 671         % over Coc 671       Coc 671         % over Coc 66       % over Coc 66         % over Coc 67       % over Coc 67         Ratoon       Co 12009         % over Coc 67       % over Coc 67         % over Coc 67       Coc 671         % over Coc 67       % over Coc 67	bat	oim tore	Akola	Basmat hnagar	Kolha pur	Mand ya	Nav sari	Pade gaon	Perumal apalle	Pravar anagar	Pune	Rud rur	Sameer wadi	Sankesh war	Thiru valla	Mean
Co 86032 CoC 671 CoSnk 05103 % over Co 860 % over CoC 67 % over CoSnk not Co 12009 CoSnk 05103 % over CoSnk Ratoon Co 12009 Co 86032 % over CoSnk Ratoon Co 12009 Co 86032 CoSnk 05103 % over CoSnk Ratoon Co 12009 % over CoSnk Ratoon Co 12009 Co 86032 CoSnk 05103 % over CoSnk CoSnk 05103 % over CoSnk % over CoSnk % over CoSnk	1	2.91 1	12.95		141.56	119.55	128.70	149.85	106.84	137.31	144.32	66.58	54.63	122.78	68.54	127.68
CoC 671 CoSnk 05103 % over Co 860 % over Co 66 % over CoSnk % over CoSnk Co 86032 Co 86032 CoSnk 05103 % over CoSnt Ratoon Co 12009 Co 86032 Co 86032 So 80 So	10	8.00 7	'9.5 <b>7</b>		122.14	94.37	106.20	139.57	109.44	138.42	139.02	99.03	71.14	100.07	87.29	113.68
CoSnk 05103 % over Coc 65 % over Coc 860 % over CoSnk % over CoSnk Co 86032 Co 86032 Coc 671 Cosnk 05103 % over CoSnk Ratoon Co 12009 % over CoSnk Ratoon Co 12009 % over CoSnk % over CoSnk	10	2.61 8	34.22	÷	104.89	81.93	108.15	123.55	122.55	131.30	124.18	128.52	34.18	89.45	65.00	107.28
% over Co 860           % over Coc 67           % over Coc 67           % over Coc 671           Co 86032           Coc 671           % over Coc 6           % over Coc 671           Coc 67103           % over Coc 671           Coc 67103           % over Coc 671           Coc 67103           % over Coc 671	11	4.68 9	¥0.10	÷	124.38	69.71	109.26	129.73	131.48	115.10	134.61	78.37	56.02	87.29	57.41	110.63
% over Coc 67           % over Cosnk           % over Cosnk           II Plant         Co 12009           Co 86032         Cosnk 05103           % over Cosnk         05103           % over Cosnk         05103           % over Cosnk         05103           % over Cosnk         05103           % over Cosnk         05103           Ratoon         Co 12009           Cosnk 05103         Cosnk 05103           % over Cosnk         05103           % over Cosnk         05103           % over Cosnk         05103           % over Cosnk         05103           % over Cosnk         05103           % over Cosnk         % over Cosnk	32 4	.55 4	i1.95		15.90	26.68	21.19	7.37	-2.38	-0.80	3.81	-32.77	-23.21	22.69	-21.48	12.32
% over CoSnk           % over CoSnk           II Plant         Co 12009           Co 86032         Co 86032           CoSnk 05103         % over Co860           % over CoSnh         % over CoSnh           Ratoon         Co 12009           Co 86032         % over CoSnh           Ratoon         Co 12009           % over CoSnh         CoSnh 05103           % over CoSnh         % over CoSnh	1 10	0.04 3	34.11		34.96	45.92	19.00	21.29	-12.82	4.58	16.22	-48.19	59.83	37.26	5.45	19.02
II Plant Co 12009 Co 86032 CoC 671 CoC 671 CoSnk 05103 % over Co860 % over Co860 % over CoSnh Ratoon Co 12009 Co 86032 Co 86032 Co 671 CoSnk 05103 % over Co 86 % over Co 86 % over CoSnh Co 12009 Co 86032 Co 86032 Sector Co 860 Co 86032 % over Co860 Co 86032 % over Co860 Co 86032 Co 86032 Co 86032 % over Co860 % over	05103 -1	.54 2	5.36		13.81	71.50	17.79	15.51	-18.74	19.30	7.21	-15.04	-2.48	40.66	19.39	15.41
Co 86032 CoC 671 CoShk 05103 % over Co860 % over Co860 % over CoShl Ratoon Co 12009 Co 86032 Co 86032 Co 671 Co 86032 % over Co 86 % over Co 86 % over Co 86 % over Co 86	12	1.47 1	16.71	111.65	120.67	90.41	127.47	135.11	132.63	134.19	112.37	153.93	93.87	128.49	96.94	119.94
CoC 671 CoSnk 05103 % over Co860 % over CoSnk % over CoSnk Ratoon Co 12009 Co 86032 Co 86032 Co 86032 Co 86032 % over Co 86 % over Co 86 % over CoSnk % over CoSnk	36	3.84 2	23.11	93.38	115.09	103.90	96.44	146.98	98.14	135.23	123.22	145.47	102.35	125.46	92.50	113.62
CoSnk 05103 % over Co860 % over Co860 % over CoSnk Ratoon Co 12009 Co 86032 Co 86032 Co 671 Co 86032 % over Co 86 % over Co 86 % over CoSnk % over CoSnk	8	t.83 1	14.39	94.37	103.80	96.63	92.02	135.95	73.47	116.71	110.79	100.58	81.94	113.85	92.22	99.78
% over Co860 % over Co560 % over Co5nk Ratoon Co 12009 Co 86032 Co 671 Co 671 Co 86032 % over Co 86 % over Co 86 % over Co5nl	10	6.43 4	16.60	110.47	107.15	116.67	103.74	140.97	95.58	124.48	120.35	112.78	89.50	122.26	96.81	111.32
% over CoC 6 % over CoSnk Ratoon Co 12009 Co 86032 CoC 671 CoC 671 CoSnk 05103 % over Co 86 % over CoC 6 % over CoC 6	32 22	2.90 -2	27.69	19.57	4.85	-12.98	32.18	-8.08	35.14	-0.77	-8.81	5.82	-8.29	2.42	4.80	5.56
% over CoSnk Ratoon Co 12009 Co 86032 Co 671 CoSnk 05103 % over Co 86 % over CoSnl Mean Co 12000	71 43	3.19 1	16.12	18.31	16.25	-6.44	38.52	-0.62	80.52	14.98	1.43	53.04	14.56	12.86	5.12	20.20
Ratoon         Co         12009           Co         86032         Coc         671           Co         671         Co         86032           %         over         Co         861           %         over         Co         861           %         over         Co         861	05103 14	t.13 -6	34.14	1.07	12.62	-22.51	22.87	-4.16	38.76	7.80	-6.63	36.49	4.88	5.10	0.13	7.74
Co 86032 CoC 671 CoShk 05103 % over Co 86 % over CoC 6 % over CoC 6 % over CoSh	12	4.42			91.63	79.03	105.65	113.62	113.99	146.49	131.46	104.70	64.14	101.32	74.57	111.23
CoC 671 CoSnk 05103 % over Co 86 % over CoC 6 % over CoC 6 % over CoSnP	88	3.23		-	86.00	96.89	81.95	115.89	67.55	154.19	122.68	123.50	79.20	70.36	76.80	100.72
CoSnk 05103 % over Co 861 % over CoC 6 % over CoSnl Mean Co 12000	78	3.03			67.91	50.26	79.33	91.03	80.85	123.18	84.09	127.42	21.67	46.82	66.57	82.89
% over Co 86/ % over CoC 6 % over CoSh	11	9.76			92.36	116.60	91.94	120.85	92.49	133.11	119.41	129.32	107.84	88.90	70.55	110.47
% over CoC 6 % over CoSnF Mean Co 12009	32 41	I.02			6.55	-18.43	28.92	-1.96	68.75	-4.99	7.16	-15.22	-19.02	44.00	-2.90	10.43
% over CoSnk Mean Co 12000	71 55	9.45		, i	34.93	57.24	33.18	24.82	40.99	18.92	56.33	-17.83	195.99	116.40	12.02	34.19
Mean Co 12009	05103 3	.89			-0.79	-32.22	14.91	-5.98	23.25	10.05	10.09	-19.04	-40.52	13.97	5.70	0.69
2P+1R *Weighted mean	<del>,</del>	9.60 1	12.95	111.65	117.95	96.33	120.61	132.86	117.82	139.33	129.38	109.04	93.87	117.53	96.94	119.65*
Co 86032	36	3.36 7	'9.5 <b>7</b>	93.38	107.74	98.39	94.86	134.15	91.71	142.61	128.31	112.34	102.35	98.63	92.50	109.73*
CoC 671	88	3.49 8	34.22	94.37	92.20	76.27	93.17	116.84	92.29	123.73	106.35	61.13	81.94	83.37	92.22	96.93*
CoSnk 05103	1	3.62 9	<b>30.10</b>	110.47	107.96	100.99	101.65	130.52	106.52	124.23	124.79	110.31	89.50	99.48	96.81	110.85*
% over Co860	32 21	I.60 4	11.95	19.57	9.48	-2.09	27.14	-0.96	28.47	-2.30	0.84	-2.94	-8.29	19.16	4.80	9.09
% . over CoC (	71 35	5.16 3	34.11	18.31	27.93	26.30	29.45	13.71	27.66	12.61	21.65	78.38	14.56	40.97	5.12	24.08
% over CoSnk	05103 5	.26 2	5.36	1.07	9.25	-4.62	18.65	1.80	10.61	12.15	3.68	-1.16	4.88	18.14	0.13	7.93

**EJPB** 

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# Table 4. Adaptability to Agronomic Variables

Trait	Row Spacing	Co 12009	CoC 671	Co 86032	CoSnk 05103
Cane yield (t/ha)	Normal	158.83	136.63	140.38	142.30
	Wide row	126.31	119.07	132.03	127.30
	Percentage gain or loss when sown	i) Normal : 10 and CoSn ii)Wide row : 0	6.24, 11.61 and 10.4 k 05103 6.08 % higher than 0	1 % higher cane yield o CoC 671	over CoC 671 , Co 86032
	Fertilizer				
	The response of nev (350:78.13:150 kg N 671, Co 86032 and (	v promising elite PK/ha) was stud CoSnk 05103 res	genotype Co 12009 ied and it gave 11.50 spectively.	to higher level of fertili ) %, 4.50 and 5.76 % I	zer i.e. 125 % RDF higher cane yield over CoC

#### Table 5. Reaction of Co 12009 to major diseases

Disease	Method of				Test	Centers			
	evaluation	Trial		Plug		No	dal		
			CBE	NAV	TVA	CBE	NAV	TVA	CoC 671
		IVT (2015-16)	MS	MR	MR	R	R	R	HS
Red rot	Artificial	AVT-I (2017-18)	-	MR	MS		R	S	HS
		AVT- II (2018-19)	-	MR	MS		R	S	HS
				KLP	PDN	SKW	NAV	PNE	Co 740
<b>.</b> .		IVT (2015-16)		MS	MS	R	MS	HS	HS
Smut	Artificial	AVT-I (2017- 18)		MS	MR	MS	HS		HS
		AVT- II (18-19)		MS			MS	HS	HS

Testing centers: CBE- Coimbatore, NAV- Navsari; TVA- Thiruvalla; KLP- Kohlapur; PDN- Padegaon; SKW- Sankeshwar; PNE- Pune; AKL- Akola

Reaction : R- Resistant, MR-Moderately resistant, MS-Moderately susceptible , HS –Highly Susceptible

#### Table 6. Reaction of Co 12009 to insect pests

		Name of variety: Co 120	009						
Pest		Trial			(	Co 12009			
		-	PDN	CBE	NAV	MDY	PUN	AKL	PWD
Early shoot borer	Natural	IVT Midlate (2015-16)	MS	LS	LS	LS	LS	LS	MS
		AVT-I (2017-18)	MS				MS	-	MS
		AVT II (2018-19)		MS					
Internode Borer	Natural	IVT Midlate (2015-16)	MS	HS	LS	MS	LS		
		AVT-I (2017-18)	LS	HS		LS	MS	-	-
		AVT II (2018-19)		LS					
Top Borer	Natural	IVT Midlate (2015-16)		LS	LS	LS			
		AVT-I (2017-18)	-			- LS			
Mealy bug	Natural	IVT Midlate (2015-16)	MS		LS		LS		
		AVT-I (2017-18)	HS				LS	-	-
Scale insect	Natural	IVT Midlate (2015-16)	MS		LS				
		AVT I (2017-18)					LS		
		-	MS						

 Testing centres:
 NAV – Navasari, PDN – Padegaon, MDY-Mandya, PUN – Pune, AKL – Akola

 Reaction:
 MS-Moderately susceptible : LS – Less susceptible ; HS – Highly Susceptible

Adaptability to Agronomic Variables

#### Table 7. Distinguishing morphological characters

S. No.	Traits	Description
1.	Parentage	[{(Co7201x(Co62174xSES91)}*Co 88037)}] x Co 62198
2.	Stool habit	Erect
3.	Stem colour (E)	Light green (Yellow green)
4.	Stem colour (UE)	Light green (Yellow green)
5.	Ivory marks	Absent
6.	Corky patches	Absent
7.	Internode shape	Cylindrical – Bobbin
8.	Internode alignment	Straight - slightly zigzag
9.	Internode diameter	2.9 cm
10.	Splits	Absent
11.	Wax	Heavy
12.	Node swelling	Absent
13.	Root zone colour (E)	Green
14.	Root zone colour (UE)	Yellow green
15.	Number of root eye rows	Three
16.	Arrangement	Irregular
17.	Bud size	Small
18.	Bud shape	Oval, pointed
19.	Bud cushion	Absent
20.	Germpore position	Apical
21.	Bud groove	Deep, near bud prominent
22.	Growth ring colour	Yellow orange
23.	Leaf length	1.4 m
24.	Leaf width	6.0 cm
25.	Lamina colour	Green
26.	Leaf carriage	Open, tip droopy
27.	Leaf sheath colour	Green
28.	Leaf sheath waxiness	Medium
29.	Leaf sheath spines	Very light
30.	Leaf sheath clasping	Tight
31.	Dewlap colour	Light yellow
32.	Ligular process	Transitional on one side and short lanceolate on other side
33.	Shape of ligule	Straight with lozenge
34.	Flowering	30%
35.	Salient characteristics	Greenish, wax coated, long internodes, prominent bud groove, tall canes, closed droopy canopy and slightly bobbin shaped canes.

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