CONTEMPORARY RESEARCH IN INDIA
ISSN 2231 - 2137

# "BREEDER'S PERSPECTIVE ON THE TILLER DYNAMICS IN SUGARCANE"

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| Received: 06/01/2018 | Edited: 18/01/2018 | Accepted: 31/01/2018 |
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**Abstract:** *Sugarcane is a vegetatively propagated crop grown for sugar. A sugarcane 'clump' comprises of several cane stalks arising from subsurface sprouting of the underground buds in the form of tillers which develop into millable canes, providing the sink for sucrose accumulation. The conventional sugarcane agriculture, wherein two or three-budded stalk pieces called 'setts' are used for planting, does not exercise strict control on the intra-row spacing and this often leads to sub- or supra-optimal tiller population. If it is suboptimal, it leads to poor yield. When in excess, it leads to competition and results in poor tiller survival. Although tillering ability is a genetically governed trait, a breeder tends to select the types which produce a near-optimal number of millable canes. What is overlooked in the process is the substantial tiller mortality. In our opinion, both these practices (breeding and agronomy) do not do justice to the very nature of the sugarcane plant and are rather wasteful. Fortunately, it is being demonstrated at a few places in the country that better sugarcane agronomy is the route to enhanced productivity and juice quality. Further, the gains extend to ratoon crops as well, resulting in an overall win-win situation for the farmer and the factory. The present-day cultivars of sugarcane are derivatives of inter-specific hybridization between mainly Saccharum officinarum and Saccharum spontaneum. The former is a cultivated species requiring careful nurture and is characterized by thick, juicy, colourful canes with good sugar content and moderate tillering. On the other hand, the latter is a wild species, very hardy and tolerant to biotic and abiotic stresses with profuse tillering.*

**Key words**: *Sugarcane, tiller dynamics and mortality %.*

## Introduction

The resulting thin, fibrous canes contain little extractable juice of low sugar content. Sugarcane varieties in vogue are an intermediate between the two, but the chromosomes of the two parental species are unequally represented in the hybrid, in favour of the cultivated species. S. spontaneum chromosomes comprise only about 10–15% in the 120– 130 (2n) chromosomes of the commercial varieties. In the Saccharum species germplasm collection, the range of number of stalks per clump in S. spontaneum was 19–274, and the corresponding values for *S. officinarum* were 4–37. Understandably, the typical segregating breeding populations show considerable variability for tillering ability, depending on the proportion of the chromosomes of the wild species, *S. spontaneum*. Breeders tend to select genotypes which produce acceptable number of millable canes, without much focus on the route (wasteful or spend-thrift) taken by a genotype to reach that number. A tiller mortality of 50–60% in sugarcane is considered acceptable. For this purpose, data of the All-India Coordinated Research Project (AICRP) on sugarcane for different agro-climatic locations were examined to see whether there are any regional differences in the kind of variability that gets selected with respect to tillering and their subsequent conversion to millable canes.

## Materials and Methods

The AICRP on sugarcane conducts multi-location varietal trials in three different sugarcane agro-climatic locations *i.e.* Central Sugarcane Research Station Padegaon, Biological Control Centre, Pravaranagar and Vasant Dada Sugar Institute Pune. The reports of Research Review Committee for the consecutive years were used for work out the extent of shoot / tiller mortality (Table. 1 to 4). The values for maximum shoot/ tiller count and the millable canes towards maturity were used to compute percentage tiller survival. In addition, efforts of individual groups were sourced for information on the various possibilities and how the scenario can be turned to advantage. Shoot count at 120 days after planting, tiller count at 180 days and number of millable canes at 240 or 300 days for all sugarcane genotypes of early maturity group, plant crop and the ratoon crop data for different agro-climatic locations are presented in Tables 1 and 4. The values are given in terms of percentage survival and are an indication of the conversion efficiency of a genotype of turning tillers into millable canes or 'effective tillers'.

Fourteen Sugarcane genotypes with three standards were tested in the three environment i.e., Padegaon, Pravaranagar and VSI Pune in I plant, II plant and ratoon during 2007-08 to 2008-09 in Randomized Block Design with three replications. Each genotype was planted in eight row each of 6.0 metre length. The spacing between two rows was 0.90 meter. Recommended dose of fertilizer i.e. 250: 115: 115 NPK was applied. All the recommended packages of practices were followed as per the season. At harvest and during consecutive growth period the growth and yield parameters were recorded. The quantative data was analysed following standard statistical procedure laid by Panse and Sukhatme (1978).

Varieties are not consistent in their tiller survival, suggesting a strong influence of the growing and cultural conditions. Further, ranks change from location to location (data not shown) and vary from crop to crop, which means tiller survival is highly influenced by the environment. Occasionally, in the test varieties, we encounter extreme types, i.e. shy tillering or high tillering genotypes. Yet, the fact remains that despite the innate capacity of a genotype, tillering is highly manipulatable culturally. Hoeing, intentional or accidental breaking of apical dominance and earthing-up are operations to encourage or discourage tillering. This can be further seen from the fact that apparently low tillering genotypes can be made to tiller profusely if their main shoot is smothered, injured or damaged by borers, etc.

**Results and Discussion**

The above facts point to two things. One is regarding the breeding of sugarcane. Seedlings do get enough space and time to have most of the tillers turning into millable canes. But the actual growing environment in subsequent clonal generations is akin to the conventional method with no control over intra-row spacing. This is where the genetic variation in tillering ability and the effective tillers (those resulting into millable canes) are selected in favour of only high tillering genotypes. It can be said that the otherwise good genotypes with a 'shy' tillering habit do not go very far. Such clones score low on cane productivity. It is hoped that this exposition shall help breeders look at their selections from a new perspective. Indirectly, such genotypes would not have their tillering phase spread out too much temporally, and shall lead to more synchronous tillers, the benefit of which will be reflected in uniform ripening and better cane quality. The second aspect is more manageable and feasible, but calls for a drastic change in the way we cultivate sugarcane. This is another stunning fact of conventional cane agriculture in subtropical India, that 30–40% germination is the norm. Nearly two-thirds of the viable buds are supposed to provide a buffer, just as the excess tillering is considered an insurance against crop failure It is not that options have not been provided, but these have lacked a strong conviction and adequate efforts to convince the scientific community and the research administrators. The technologies in question are sett transplanting (STP) or modifications thereof, such as polybag method, single pre-sprouted bud planting, bud-chip method, etc. The benefits of these have been demonstrated, but the required follow-up by extension workers to popularize these has not been done sufficiently.

The present investigation was undertaken to find out the suitable sugarcane genotypes with minimal tiller mortality leads to gain higher cane yield and commercial cane yield. Total fourteen genotypes with three standards were tested to screen out the sugarcane genotype for maximum number of millable cane (NMC) and tiller population.

**Padegaon**

The highest population of number of millable canes in Advanced varietal trial I plant, II plant and ratoon was recorded by the genotype Co 0312 (121.00) thousand per hectare. Overall survival per cent of the genotype CoVC 9982 (74.34 %) stood first in Advanced varietal trial I plant, II plant and ratoon followed by CoM 9902 (69.17 %) over the best standard CoC 671 (55.44 %).

**Pravaranagar**

The highest survival per cent in Advanced varietal trial I plant, II plant and ratoon was recorded by the genotype Co 0315 (87.42 %) followed by CoM 9902 (82.30 %), best standard CoC 671 (79.46 %), CoVC 9982 (78.80 %) over the rest of genotypes.

**VSI, Pune**

The highest population of number of millable canes in Advanced varietal trial I plant, II plant and ratoon was recorded by the genotype Co 0308 (136.78, 126.78 and 115.00 respectively). However, the same genotype for overall survival per cent of the genotype Co 0308 (66.80 %) stood first in Advanced varietal trial I plant, II plant and ratoon followed by Co 0315 (55.52 %) and the best standard CoC 671 (52.82 %).The germination is more than 85% and establishment more than 90%, with appropriate care. Nine tillers per clump are attained by 120 days of transplanting. This tiller count of 100,000–125,000/ha does not reduce, as hardly any tiller mortality is observed. Individual canes acquire a weight of up to 1.5 kg. This results in a cane yield of 150–180 t/ha, which is a huge gain. The quality also is in no way less than the conventional method. The system not only ensures more return to the farmer from sugarcane, but adds to his profit through an intercrop. Thus, by judicious modification of the method of planting which takes care of the intra-row spacing, the tillering attribute of sugarcane is allowed to have its full expression. Also, the cultural practices ensure that the tillers produced are nurtured to develop into millable canes and harvested to bumper yields. This methodology not only ensures that all the energy of the plant is utilized in producing harvestable biomass, but that canes get full term to acquire impressive girth and weight. When tillers are not allowed to form after a particular stage (implying that secondary and tertiary tillers contribute minimally to the total count), all the millable canes are physiologically closer in maturity leading to better cane quality. The underlying synchronous tillering, for which adequate variability does exist in segregating populations, could be a selectable trait.

Therefore, suggestion is made to all those involved with sugarcane development to help rewrite sugarcane agronomy in the long-term interest of sugarcane farmers, industry and the nation. Not only the required technology is in place, but it has been practically demonstrated and found feasible and profitable. It is no more a matter of choice, but imperative that if we want to meet the future targets for sugarcane and sugar, precision farming is the answer. The greatest spin-off will be a better control on the quantity and quality of sugarcane seed with a significant reduction in the quantity of seed required. The attention of breeders is also sought to be drawn on the possibility of breeding more efficient genotypes with a higher tiller to millable cane conversion ratio.

**Conclusion:**

The overall pooled results of Advanced varietal trial I plant , II plant and ratoon indicate that, the genotype Co 0312 (106.89 and 201.77 thousand per hectare) recorded the highest number of millable canes and tiller population at 120 days after planting respectively. However, the highest tiller survival per cent was recorded by the genotype Co 0315 (68.22 %) followed by Co 0308 (67.45 %), Co 0314 (66.23 %), CoVC 9982 (65.81 %) and CoM 9902 (62.30 %) over the rest of genotypes and best standard CoC 671 (60.85 %).

## References


Anon., 2006. All India Coordinated Research Project on Sugarcane, Principal Investigator's Report for Varietal Improvement Programme 2005–2006, Sugarcane Breeding Institute, Coimbatore.

Barber, C. A., Studies on Indian sugarcane. No. 4. Tillering or underground branching. Mem. Dep. Agric. India Bot. Ser., 1918, 10(2), 39–153.

Dwivedi, R. S. and Srivastava, K. K., A scenario of research on physiology and biochemistry of sugarcane. In Sugarcane Research and Development in Subtropical India (eds Singh, G. B. and Sinha, O. K.), IISR, Lucknow, 1993, pp. 143–190.

Garside, A. L. and Bell, M. J., Row spacing and planting density effects on the growth and yield of sugarcane. 1. Responses in fumigated and non-fumigated soil. Crop Pasture Sci., 2009, 60(6), 532–543.

Nagendran, K., Mechanization programme in Sakthi Sugars. In National Workshop on Mechanization of Sugarcane Cultivation. Sakthi Nagar, Erode, 1999, pp. 45–51.

Panse, V. G. and Sukhatme, P. V., 1967, Statistical Methods for Agricultural Workers, ICAR., Publication New Delhi., p.359.

Srivastava, K. K., Narasimhan, R. and Shukla, R. K., A new technique for sugarcane planting. Indian Farming, 1981, 31, 15–17.

Sundra, B., Influence of varieties, seed and fertilizer rates and planting pattern on sugarcane (*Saccharum officinarum*) grown under wide row spacing. Indian Sugar, 2002, LII(5), 341–347.


**Table 1: Percentage of survival of tillres in the Advanced Varietal trial (Early) in different agro climatic locations**

| Sr. No. | Genotypes | Tiller Survival (%) Pooled results of I, II plant and ratoon. | | | | | | | | | | | | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Padegaon | | | Pravaranagar | | | VSI, Pune | | | Mean over the locations | | | |
| | | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | |
| 1 | Co 0204 | 103.62 | 155.83 | 66.49 | 95.67 | 147.00 | 65.08 | 95.48 | 215.05 | 44.40 | 98.26 | 172.63 | **56.92** | |
| 2 | Co 0205 | 89.50 | 154.35 | 57.99 | 97.39 | 147.74 | 65.92 | 98.03 | 206.58 | 47.46 | 94.98 | 169.56 | **56.01** | |
| 3 | Co 0209 | 80.19 | 121.67 | 65.91 | 92.10 | 126.08 | 73.05 | 82.00 | 174.41 | 47.02 | 84.76 | 140.72 | **60.24** | |
| 4 | Co 0302 | 93.97 | 141.39 | 66.46 | 97.16 | 134.91 | 72.02 | 91.04 | 180.86 | 50.34 | 94.06 | 152.38 | **61.72** | |
| 5 | Co 0306 | 85.76 | 130.93 | 65.50 | 94.02 | 128.28 | 73.29 | 82.27 | 198.71 | 41.40 | 87.35 | 152.64 | **57.23** | |
| 6 | Co 0308 | 84.72 | 143.52 | 59.03 | 105.24 | 136.32 | 77.20 | 126.19 | 188.90 | 66.80 | 105.38 | 156.25 | **67.45** | 2 |
| 7 | Co 0310 | 94.34 | 156.11 | 60.43 | 103.55 | 142.83 | 72.50 | 96.89 | 197.95 | 48.95 | 98.26 | 165.63 | **59.32** | |
| 8 | Co 0312 | 121.00 | 192.31 | 62.92 | 96.57 | 152.15 | 63.47 | 103.11 | 260.85 | 39.53 | 106.89 | 201.77 | **52.98** | |
| 9 | Co 0314 | 88.41 | 128.61 | 68.74 | 96.20 | 122.74 | 78.38 | 93.22 | 168.17 | 55.44 | 92.61 | 139.84 | **66.23** | 3 |
| 10 | Co 0315 | 72.93 | 110.65 | 65.91 | 91.31 | 104.46 | 87.42 | 76.48 | 137.76 | 55.52 | 80.24 | 117.62 | **68.22** | 1 |
| 11 | CoM 9902 | 88.19 | 127.50 | 69.17 | 92.59 | 112.50 | 82.30 | 74.85 | 170.33 | 43.94 | 85.21 | 136.78 | **62.30** | |
| 12 | CoM 9903 | 71.45 | 133.52 | 53.52 | 88.73 | 130.44 | 68.03 | 73.22 | 196.41 | 37.28 | 77.80 | 153.46 | **50.70** | |
| 13 | CoM 0254 | 97.81 | 160.74 | 60.85 | 101.65 | 151.51 | 67.09 | 77.30 | 189.09 | 40.88 | 92.25 | 167.11 | **55.20** | |
| 14 | CoVc 9982 | 104.91 | 141.11 | 74.34 | 99.47 | 126.24 | 78.80 | 98.70 | 193.20 | 51.09 | 101.03 | 153.52 | **65.81** | |
| **15** | **Co 85004 ©** | **81.85** | **130.56** | **62.69** | **100.44** | **133.50** | **75.24** | **99.44** | **227.31** | **43.75** | **93.91** | **163.79** | **57.34** | |
| **16** | **Co 94008 ©** | **85.63** | **135.56** | **63.17** | **88.56** | **115.58** | **76.63** | **101.26** | **213.36** | **47.46** | **91.82** | **154.83** | **59.30** | |
| **17** | **CoC 671 ©** | **70.64** | **127.41** | **55.44** | **89.63** | **112.80** | **79.46** | **92.67** | **175.45** | **52.82** | **84.31** | **138.55** | **60.85** | |
| **Mean** | | **89.11** | **139.93** | **63.45** | **95.90** | **130.89** | **73.87** | **91.89** | **193.79** | **47.89** | **92.30** | **155.12** | **59.87** | |
| **SE+/-** | | 6.34 | 14.18 | | 5.80 | 12.83 | | 8.33 | 7.18 | | 5.65 | 9.87 | | |
| **CD at 5%** | | 18.28 | 40.85 | | 16.71 | 36.96 | | 24.00 | 22.80 | | 16.28 | 27.62 | | |
| **CV %** | | 12.33 | 17.55 | | 10.47 | 16.98 | | 15.70 | 14.56 | | 10.61 | 14.98 | | |

**Table 2: Mean values for number of tillers and millable canes and percentage of tiller survival in sugarcane trials. a) Padegaon (2007- 08 to 2008 - 09)**

| Sr. No. | Genotypes | Advanced Varietal trial I Plant | | | Advanced Varietal trial II Plant | | | Advanced Varietal trial Ratoon | | | Overall Mean | | | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | |
| 1 | Co 0204 | 88.33 | 181.39 | 48.70 | 118.49 | 161.94 | 73.17 | 104.03 | 124.17 | 83.78 | 103.62 | 155.83 | **66.49** | |
| 2 | Co 0205 | 73.68 | 180.83 | 40.75 | 108.57 | 175.83 | 61.75 | 86.25 | 106.39 | 81.07 | 89.50 | 154.35 | **57.99** | |
| 3 | Co 0209 | 72.85 | 139.72 | 52.14 | 86.00 | 117.50 | 73.19 | 81.74 | 107.78 | 75.84 | 80.19 | 121.67 | **65.91** | |
| 4 | Co 0302 | 80.14 | 157.78 | 50.79 | 113.02 | 148.89 | 75.91 | 88.75 | 117.50 | 75.53 | 93.97 | 141.39 | **66.46** | |
| 5 | Co 0306 | 71.04 | 170.28 | 41.72 | 99.84 | 111.67 | 89.41 | 86.39 | 110.83 | 77.94 | 85.76 | 130.93 | **65.50** | |
| 6 | Co 0308 | 85.97 | 158.33 | 54.30 | 84.10 | 177.78 | 47.31 | 84.10 | 94.44 | 89.05 | 84.72 | 143.52 | **59.03** | |
| 7 | Co 0310 | 83.75 | 165.83 | 50.50 | 106.83 | 188.33 | 56.72 | 92.43 | 114.17 | 80.96 | 94.34 | 156.11 | **60.43** | |
| 8 | Co 0312 | 107.15 | 236.67 | 45.28 | 137.30 | 197.78 | 69.42 | 118.54 | 142.50 | 83.19 | 121.00 | 192.31 | **62.92** | |
| 9 | Co 0314 | 75.49 | 131.67 | 57.33 | 107.86 | 154.72 | 69.71 | 81.88 | 99.44 | 82.33 | 88.41 | 128.61 | **68.74** | 3 |
| 10 | Co 0315 | 53.33 | 100.83 | 52.89 | 91.90 | 153.89 | 59.72 | 73.54 | 77.22 | 95.24 | 72.93 | 110.65 | **65.91** | |
| 11 | CoM 9902 | 48.61 | 93.33 | 52.08 | 110.00 | 173.06 | 63.56 | 105.97 | 116.11 | 91.27 | 88.19 | 127.50 | **69.17** | 2 |
| 12 | CoM 9903 | 58.68 | 152.22 | 38.55 | 83.46 | 173.61 | 48.07 | 72.22 | 74.72 | 96.65 | 71.45 | 133.52 | **53.52** | |
| 13 | CoM 0254 | 90.28 | 177.22 | 50.94 | 124.82 | 219.44 | 56.88 | 78.34 | 85.56 | 91.56 | 97.81 | 160.74 | **60.85** | |
| 14 | CoVc 9982 | 86.46 | 136.39 | 63.39 | 121.67 | 179.72 | 67.70 | 106.60 | 107.22 | 99.42 | 104.91 | 141.11 | **74.34** | 1 |
| 15 | Co 85004 © | 77.43 | 147.22 | 52.59 | 108.25 | 147.22 | 73.53 | 59.86 | 97.22 | 61.57 | 81.85 | 130.56 | **62.69** | |
| 16 | Co 94008 © | 66.67 | 140.78 | 47.36 | 84.05 | 125.68 | 66.87 | 106.18 | 140.22 | 75.72 | 85.63 | 135.56 | **63.17** | |
| 17 | CoC 671 © | 59.24 | 113.61 | 52.14 | 85.03 | 165.56 | 51.36 | 67.64 | 103.06 | 65.63 | 70.64 | 127.41 | **55.44** | |
| **Mean** | | **75.24** | **152.01** | **50.09** | **104.19** | **163.10** | **64.96** | **87.91** | **106.97** | **82.75** | **89.11** | **140.69** | **63.45** | |
| **SE+/-** | | 5.74 | 9.44 | | 5.35 | 12.09 | | 4.22 | 7.02 | | 6.34 | 14.18 | | |
| **CD at 5%** | | 16.54 | 27.21 | | 15.41 | 34.83 | | 12.16 | 20.22 | | 18.28 | 40.85 | | |
| **CV %** | | 11.99 | 10.84 | | 8.81 | 12.88 | | 8.32 | 11.45 | | 12.33 | 17.55 | | |

**Table 3: Mean values for number of tillers and millable canes and percentage of tiller survival in sugarcane trials. b) Pravarnagar (2007- 08 to 2008 - 09)**

| Sr. No. | Genotypes | Advanced Varietal trial I Plant | | | Advanced Varietal trial II Plant | | | Advanced Varietal trial Ratoon | | | Overall Mean | | | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | |
| 1 | Co 0204 | 98.63 | 113.11 | 87.20 | 97.75 | 176.46 | 55.39 | 90.62 | 151.43 | 59.84 | 95.67 | 147.00 | **65.08** | |
| 2 | Co 0205 | 102.20 | 118.74 | 86.07 | 101.43 | 178.83 | 56.72 | 88.55 | 145.66 | 60.79 | 97.39 | 147.74 | **65.92** | |
| 3 | Co 0209 | 103.07 | 122.34 | 84.25 | 90.44 | 135.34 | 66.82 | 82.78 | 120.56 | 68.66 | 92.10 | 126.08 | **73.05** | |
| 4 | Co 0302 | 105.08 | 118.33 | 88.80 | 93.19 | 159.49 | 58.43 | 93.22 | 126.90 | 73.46 | 97.16 | 134.91 | **72.02** | |
| 5 | Co 0306 | 103.24 | 114.16 | 90.43 | 91.09 | 165.57 | 55.02 | 87.73 | 105.12 | 83.46 | 94.02 | 128.28 | **73.29** | |
| 6 | Co 0308 | 110.40 | 120.38 | 91.71 | 105.95 | 150.12 | 70.58 | 99.38 | 138.47 | 71.77 | 105.24 | 136.32 | **77.20** | |
| 7 | Co 0310 | 108.16 | 120.41 | 89.83 | 111.29 | 162.54 | 68.47 | 91.19 | 145.53 | 62.66 | 103.55 | 142.83 | **72.50** | |
| 8 | Co 0312 | 110.30 | 120.65 | 91.42 | 74.87 | 130.88 | 57.21 | 104.55 | 204.93 | 51.02 | 96.57 | 152.15 | **63.47** | |
| 9 | Co 0314 | 103.45 | 118.36 | 87.40 | 95.69 | 137.54 | 69.57 | 89.47 | 112.31 | 79.66 | 96.20 | 122.74 | **78.38** | |
| 10 | Co 0315 | 104.61 | 113.33 | 92.31 | 81.78 | 105.55 | 77.48 | 87.55 | 94.49 | 92.66 | 91.31 | 104.46 | **87.42** | 1 |
| 11 | CoM 9902 | 105.91 | 124.43 | 85.12 | 88.64 | 102.10 | 86.82 | 83.21 | 110.97 | 74.98 | 92.59 | 112.50 | **82.30** | 2 |
| 12 | CoM 9903 | 103.93 | 118.43 | 87.76 | 84.79 | 142.43 | 59.53 | 77.48 | 130.46 | 59.39 | 88.73 | 130.44 | **68.03** | |
| 13 | CoM 0254 | 110.80 | 122.71 | 90.29 | 103.55 | 179.29 | 57.76 | 90.61 | 152.53 | 59.40 | 101.65 | 151.51 | **67.09** | |
| 14 | CoVc 9982 | 105.20 | 124.54 | 84.47 | 98.57 | 130.60 | 75.47 | 94.65 | 123.57 | 76.60 | 99.47 | 126.24 | **78.80** | |
| 15 | Co 85004 © | 101.78 | 117.37 | 86.72 | 101.27 | 145.81 | 69.45 | 98.28 | 137.31 | 71.58 | 100.44 | 133.50 | **75.24** | |
| 16 | Co 94008 © | 95.20 | 113.55 | 83.84 | 84.99 | 120.90 | 70.30 | 85.50 | 112.28 | 76.15 | 88.56 | 115.58 | **76.63** | |
| 17 | CoC 671 © | 102.37 | 112.28 | 91.17 | 82.93 | 110.68 | 74.93 | 83.58 | 115.43 | 72.41 | 89.63 | 112.80 | **79.46** | 3 |
| **Mean** | | **104.37** | **118.42** | **88.16** | **93.42** | **143.18** | **66.47** | **89.90** | **131.06** | **70.26** | **95.90** | **130.89** | **73.87** | |
| **SE+/-** | | 3.13 | 1.16 | | 2.25 | 12.78 | | 1.45 | 1.79 | | 5.80 | 12.83 | | |
| **CD at 5%** | | 9.02 | 3.35 | | 6.49 | 36.84 | | 4.17 | 5.16 | | 16.71 | 36.96 | | |
| **CV %** | | 5.17 | 1.70 | | 4.13 | 15.08 | | 2.80 | 2.72 | | 10.47 | 16.98 | | |

**Table 4: Mean values for number of tillers and millable canes and percentage of tiller survival in sugarcane trials. c) VSI Pune (2007- 08 to 2008 - 09)**

| Sr. No. | Genotypes | Advanced Varietal trial I Plant | | | Advanced Varietal trial II Plant | | | Advanced Varietal trial Ratoon | | | Overall Mean | | | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | NMC (000/ha) | Tiller (000/ha) at 120 DAP | Survival % | |
| 1 | Co 0204 | 102.56 | 235.00 | 43.64 | 108.11 | 283.88 | 38.08 | 75.78 | 126.27 | 60.01 | 95.48 | 215.05 | **44.40** | |
| 2 | Co 0205 | 101.44 | 250.67 | 40.47 | 114.11 | 253.67 | 44.98 | 78.55 | 115.39 | 68.07 | 98.03 | 206.58 | **47.46** | |
| 3 | Co 0209 | 84.44 | 211.67 | 39.89 | 96.67 | 219.00 | 44.14 | 64.89 | 92.55 | 70.11 | 82.00 | 174.41 | **47.02** | |
| 4 | Co 0302 | 98.89 | 206.00 | 48.00 | 101.89 | 231.11 | 44.09 | 72.33 | 105.46 | 68.59 | 91.04 | 180.86 | **50.34** | |
| 5 | Co 0306 | 82.11 | 220.33 | 37.27 | 97.00 | 274.22 | 35.37 | 67.70 | 101.57 | 66.65 | 82.27 | 198.71 | **41.40** | |
| 6 | Co 0308 | 136.78 | 217.33 | 62.94 | 126.78 | 224.89 | 56.37 | 115.00 | 124.47 | 92.39 | 126.19 | 188.90 | **66.80** | 1 |
| 7 | Co 0310 | 101.44 | 216.00 | 46.96 | 101.22 | 252.56 | 40.08 | 88.00 | 125.28 | 70.24 | 96.89 | 197.95 | **48.95** | |
| 8 | Co 0312 | 107.55 | 284.00 | 37.87 | 106.44 | 323.89 | 32.86 | 95.33 | 174.66 | 54.58 | 103.11 | 260.85 | **39.53** | |
| 9 | Co 0314 | 89.67 | 178.67 | 50.19 | 107.22 | 220.44 | 48.64 | 82.78 | 105.39 | 78.55 | 93.22 | 168.17 | **55.44** | 3 |
| 10 | Co 0315 | 74.89 | 141.33 | 52.99 | 94.56 | 178.56 | 52.96 | 60.00 | 93.38 | 64.25 | 76.48 | 137.76 | **55.52** | 2 |
| 11 | CoM 9902 | 72.11 | 180.33 | 39.99 | 92.89 | 226.78 | 40.96 | 59.55 | 103.88 | 57.33 | 74.85 | 170.33 | **43.94** | |
| 12 | CoM 9903 | 69.44 | 233.67 | 29.72 | 90.33 | 250.22 | 36.10 | 59.89 | 105.35 | 56.85 | 73.22 | 196.41 | **37.28** | |
| 13 | CoM 0254 | 74.89 | 202.00 | 37.07 | 90.22 | 242.00 | 37.28 | 66.78 | 123.28 | 54.17 | 77.30 | 189.09 | **40.88** | |
| 14 | CoVc 9982 | 101.89 | 211.33 | 48.21 | 108.22 | 255.00 | 42.44 | 86.00 | 113.28 | 75.92 | 98.70 | 193.20 | **51.09** | |
| 15 | Co 85004 © | 79.44 | 294.00 | 27.02 | 117.78 | 263.11 | 44.76 | 101.11 | 124.81 | 81.01 | 99.44 | 227.31 | **43.75** | |
| 16 | Co 94008 © | 106.47 | 220.35 | 48.32 | 103.12 | 223.18 | 46.20 | 94.20 | 196.54 | 47.93 | 101.26 | 213.36 | **47.46** | |
| 17 | CoC 671 © | 95.44 | 181.00 | 52.73 | 99.89 | 240.00 | 41.62 | 82.67 | 105.35 | 78.47 | 92.67 | 175.45 | **52.82** | |
| **Mean** | | **92.91** | **216.69** | **43.72** | **103.32** | **244.85** | **42.76** | **79.44** | **119.82** | **67.36** | **91.89** | **193.79** | **47.89** | |
| **SE+/-** | | 10.83 | 1.59 | | 2.78 | 11.76 | | 6.81 | 7.02 | | 8.33 | 7.18 | | |
| **CD at 5%** | | 29.93 | 4.39 | | 10.15 | 42.78 | | 24.77 | 21.29 | | 24.00 | 22.80 | | |
| **CV %** | | 14.12 | 3.32 | | 3.33 | 5.93 | | 11.15 | 16.52 | | 15.70 | 14.56 | | |