



## Plant Growth and Nut Characteristics of Cashew Orchards in Coastal Districts of Andhra Pradesh

**Key words :** Cashew, Plant Growth and Nut Characteristics.

Cashew (*Anacardium occidentale* L.) belongs to the family Anacardiaceae. Introduced to India as a bio-agent for soil conservation along the Western Ghats, cashew has emerged as a dollar earning commercial crop. In addition, cashew industry provides employment to lakhs of people in India. Andhra Pradesh is the second largest State to grow cashew of the country and occupies an area of 1.5 lakh ha and a production of 88,000 metric tonnes with an average productivity of 840 kg kernels ha<sup>-1</sup>.

An investigation was conducted during 2006 - 07 in coastal districts of Andhra Pradesh, selecting 12 mandals orchards of 10 years old cashew plantation. The study was taken up in randomized block design (RBD) with five replications. There were five selected trees in each garden for the purpose of plant growth and nut characters. Observation on plant height (m) was measured by altimeter; plant spread (m), number of nuts tree<sup>-1</sup>, nut weight (gm), nut volume (cc) and nut diameter (mm) were also recorded. The statistical analysis was performed as outlined by Panse and Sukhatme (1967).

The data of plant growth parameters of cashewnut viz., plant height, plant spread from both north to south and east to west are presented in Table 1. The cashew plants of Santha Bommali mandals of Srikakulam district, Salur mandal of Vizianagaram district and Nidadavol and Jangareddygudem mandals of West Godavari district recorded greater plant height and plant spread in both the directions, compared to the plants grown in all other mandals of other districts. It could probably be due to nature of red soil with sufficient minerals in the cashew plantation tracts of Srikakulam, Vizianagaram and West Godavari districts.

In contrast, the cashew plantations of Bapatla and Karlapalem mandals of Guntur district and Vetapalem, Chinaganjam mandals of Prakasam

district recorded minimum plant growth. It could probably be due to raising of these plantations in completely coastal sands which are usually low in organic matter and other mineral nutrients.

With respect to nut characters and nut yields, it was noticed (Table 1) that the nuts of gardens of all the mandals of Vizianagaram, Visakhapatnam and West Godavari district and Tekkali and Santha Bommali mandals of cashew orchards of Srikakulam district were found to be large in nut volume, nut weight, nut diameter and nut yield. It could probably be ascribed to better nutrient status of soil compared to coastal sandy soils of Guntur and Prakasam districts. Maximum yield (1912 of nuts, 13.12 kg tree<sup>-1</sup>) was recorded by Nidadavol mandals of West Godavari district followed by Jangareddygudem (1891 nuts and 12.32 kg tree<sup>-1</sup>) of the same district. The next best plantations with more nuts and yield tree<sup>-1</sup> were found to be in Salur mandal of Vizianagaram district followed by Rolugunta mandal of Visakhapatnam district. The yield attributing characters of cashewnut plantations of Prakasam district and Guntur district were found to be associated with lower nut yields.

Beneficial effect of nitrogen in increasing the nut production has been observed largely may be due to the fact that the higher level of nitrogen in soil increased the activity of enzyme urease (Kumar *et al.*, 1985) which in turn might be responsible for hydrolysis of urea to ammonia and ready availability to plant (Webster *et al.*, 1955). Nitrogen being the component of amino acids, nucleotides, nucleic acids, number of co-enzymes, auxins and cytokinins can induce cell elongation, enlargement and development and there by improve the nut production as explained by Ghosh (1990). An increase in nut weight due to N application may observed here can be attributed to more synthesis of carbohydrates (Raheja, 1971), protein and other metabolites (Kanwar, 1976).

Table 1. Plant and nut characteristics of 12 mandals cashew orchards

| Mandal       | Plant height (m) | Plant spread (m)(N-S) | Plant spread (m) (E-W) | Nut volume (cc) | Nut weight (g) | Nut diameter (mm) | No. of Nuts tree <sup>-1</sup> | Yield of nuts (kg tree <sup>-1</sup> ) |
|--------------|------------------|-----------------------|------------------------|-----------------|----------------|-------------------|--------------------------------|--|
| Tekkali      | 5.13             | 7.50                  | 7.38                   | 4.52            | 5.53           | 17.87             | 1832.12                        | 10.12                                  |
| S. Bommalli  | 6.14             | 8.51                  | 8.34                   | 5.23            | 6.32           | 17.81             | 1636.21                        | 11.20                                  |
| Salur        | 5.92             | 8.17                  | 8.28                   | 5.32            | 6.13           | 17.85             | 1532.72                        | 11.48                                  |
| R. B. Puram  | 5.74             | 7.13                  | 7.18                   | 4.89            | 5.89           | 17.52             | 1461.44                        | 10.31                                  |
| Rolugunta    | 5.81             | 7.81                  | 7.35                   | 5.12            | 6.10           | 17.48             | 1632.17                        | 11.18                                  |
| Narsipatnam  | 5.24             | 7.32                  | 7.54                   | 4.73            | 5.84           | 17.32             | 1578.15                        | 10.89                                  |
| Nidadavol    | 6.45             | 8.81                  | 8.48                   | 5.93            | 6.50           | 18.96             | 1912.00                        | 13.12                                  |
| J.R. Gudem   | 6.17             | 8.43                  | 8.46                   | 5.68            | 6.53           | 18.89             | 1891.00                        | 12.23                                  |
| Vetapalem    | 5.25             | 7.34                  | 7.24                   | 4.93            | 5.45           | 16.15             | 1261.50                        | 8.80                                   |
| Chinnaganjam | 5.04             | 7.10                  | 7.12                   | 4.72            | 5.27           | 16.10             | 1238.00                        | 8.57                                   |
| Bapatla      | 5.12             | 7.18                  | 7.21                   | 4.18            | 5.03           | 16.55             | 1307.00                        | 8.92                                   |
| Karlapalem   | 5.51             | 7.21                  | 7.15                   | 4.63            | 5.43           | 16.32             | 1252.42                        | 8.86                                   |
| Sem±         | 0.107            | 0.107                 | 0.148                  | 0.09            | 0.115          | 0.102             | 0.54                           | 0.21                                   |
| Range        | 5.04             | 7.10                  | 7.12                   | 4.18            | 5.03           | 16.10             | 1238.00                        | 8.57                                   |
|              | 6.45             | 8.81                  | 8.48                   | 5.93            | 6.53           | 18.96             | 1912.00                        | 13.12                                  |
| CD (0.05)    | 0.30             | 0.306                 | 0.42                   | 0.26            | 0.33           | 0.021             | 1.56                           | 0.60                                   |
| CV%          | 10.23            | 10.23                 | 12.13                  | 9.57            | 10.75          | 6.52              | 5.46                           | 14.82                                  |

CD = Cifical difference,

CV = Coefficient of variation

Phosphorus can play a key role in cellular energy transfer, respiration and photosynthesis. The increased response of cashew plantations in red soils of coastal districts could be attributed to cellular energy transfer, better utilization of nucleotides and sugar phosphate as explained by Ghosh (1989). Potassium plays a vital role in the formation of amino acids and proteins from ammonical ions which are absorbed from the soil (Raheja., 1971).

It can be concluded that cashew orchards of all mandals of West Godavari, Srikakulam and Vizianagaram district were found to be superior in growth and nut yield attributing characters compared to cashew plantations of Guntur and Prakasam district mandals. However, keeping in view the soil nutrient status and leaf analysis data, it is advised

in general that sufficient application of organic matter and inorganic fertilizers to obtain vigorous growth and higher productivity of nuts particularly in cashew plantations of coastal sands is necessary.

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(Received on 12.12.2009 and revised on 20.04.2010)