

# SOIL SCIENCE AND AGRICULTURAL CHEMISTRY

## Assessment of Soil Carbon Stock under Arecanut and Coconut Plantations in Karnataka

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A study was undertaken across different agro-climatic zones (ACZ) of Karnataka, with an objective to assess the vertical distribution of soil carbon stock in coconut and arecanut plantations. The higher soil carbon stock was found in arecanut ( $2.71 \text{ kg m}^{-2}$ ) as compared to coconut ( $2.32 \text{ kg m}^{-2}$ ) plantations. Significantly higher soil carbon stock was observed in hilly zone ( $3.25 \text{ kg m}^{-2}$ ) followed by southern transitional zone ( $2.52 \text{ kg m}^{-2}$ ), coastal zone ( $2.51 \text{ kg m}^{-2}$ ), southern dry zone ( $2.3 \text{ kg m}^{-2}$ ), and eastern dry zone ( $1.96 \text{ kg m}^{-2}$ ). Irrespective of crops and zones, arecanut soils had higher carbon content than coconut soils. The pooled data revealed that surface (0-30 cm) soil depth had 35.7 and 36.4 per cent higher carbon stock in arecanut and coconut, respectively as compared to sub-surface soil depth. In sub-surface soil (30-120 cm), 64.3 and 63.6 per cent soil carbon stock was noticed in arecanut and coconut, respectively. Significantly ( $p < 0.05$ ) higher soil carbon stock was recorded within 0 - 30 cm ( $3.63 \text{ kg m}^{-2}$ ) soil depth and it was found to decline with depth. The interaction effect between crops, zones and depths was found to be significant for soil organic carbon in plantations across ACZ's. Significant difference was observed for dehydrogenase (DHA), alkaline phosphatase (ALP) and acid phosphatase (ACP) in arecanut and coconut soils but no difference was observed for available N,  $\text{P}_2\text{O}_5$  and  $\text{K}_2\text{O}$ . A significant positive correlation was observed for different carbon pools with pH, clay, CEC, available N,  $\text{P}_2\text{O}_5$  and  $\text{K}_2\text{O}$ , DHA, ALP and ACP activity and negative correlation with sand and bulk density of soil. In general, low management attained less soil carbon status in whole soil profile (0-120 cm) than the high level management in both crops representing all agro climatic zones.

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