

CARBONIC ANHYDRASE, BIOLOGICALLY  
ACTIVE ZINC AND CARBON FIXATION  
IN COCONUT PALM

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ABSTRACT

Activity of carbonic anhydrase in the first fully opened leaf (FFL) of erect canopied palms (EC) was higher than that of spherical canopied palms (SC) but the reverse was true in case of middle leaves (ML). The carbon fixation rate of FFL and ML of SC palms did not differ significantly but in EC palms CO<sub>2</sub> assimilation of former leaf was higher than latter one. However the CO<sub>2</sub> assimilation rate in FFL of EC palms did not differ markedly with FFL and ML of SC palms. But CO<sub>2</sub> fixation in ML of SC palms was significantly higher than that of EC palms. This is correlated with EDTA-zinc (biologically active zinc) but not with total zinc, since in all types of palms the total zinc ranged from 24-28 ppm. Also the nut yield in SC palms was found to exceed by 1.2-2.5 times over that in EC palms. Irrespective of canopy structure, the root (wilt) diseased palms also showed the same trend as that of EC palms. The correlation coefficient values of biologically active zinc, total zinc and carbonic anhydrase was found to be 0.94, 0.66 and 0.78, respectively, with CO<sub>2</sub> assimilation rate; and 0.90, 0.56 and 0.76, respectively, with nut yield. This reveals that it is not the total zinc but it is carbonic anhydrase activity and the biologically active zinc which play an important role in regulating CO<sub>2</sub> fixation and nut yield of coconut.