EFFECT OF ELEVATED AND SUPER ELEVATED CO_2 CONCENTRATION ON GROWTH AND PRODUCTIVITY OF COTTON

S.E.S.A.khader, V.Ravichandran[1] and N.Gopalakrishnan

Centre Institute for Cotton Research, Regional Station
Coimbatore 641 003, Tamil Nadu, India

ABSTRACT

The CO_2 concentration in the atmosphere is increasing and is expected to double sometime near the middle of the next century. To determine the effects of such a CO_2 increase on cotton (*Gossypium hirsutum L.*) growth and productivity, experiments were conducted with open top chambers at different CO_2 concentrations like 450, 650 and 850 ppm and ambient conditions (360 ppm). Morphological attributes observed at harvest such as plant height, sympodial number and length and leaf number increased with increase in CO_2 concentration up to 650 ppm. Also productivity attributes like number of bolls and per boll weight recorded maximum under 650 ppm of elevated CO_2 atmosphere. Total dry matter production of different plant parts and harvest index gave higher percentage for plants, grown under elevated CO_2 atmosphere (irrespective of the various CO_2 concentration in the atmosphere) than the ambient. Thus, results imply that cotton plants respond favourably in terms of morphology and productivity indicated by increasing the yield and biomass production up to 650 ppm. Further increase did not have any desirable effect on cotton plant. Therefore, the recommended optimum level of CO_2 concentration for cotton growth is up to 650 ppm.

Key words : cotton, sympodia, boll, harvest index