

Temperature and Water Stress Effects on the Growth of Corn Seedlings (*Zea mays* L.)

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Effects of temperature and water stress on growth of corn seedlings (*Zea mays* L.) were determined in a walk-in growth chamber with a light intensity of 30×10^3 Lux and a day night cycle of 14/10 hours, with two water regimes and at constant temperatures of 20°, 25°, 28° and 30°C. The growth of the seedlings at different treatments was exponential. The relative growth rate of the seedlings ranged from .01 to .05 g g⁻¹ day⁻¹ for the roots and shoots at different treatments of the experiment. The optimum temperature for the growth of shoots and roots was 28°C. The dry treatments had always lower growth rates in shoots and roots at different temperatures. The performance of the growth chamber was satisfactory, but addition of relative humidity regulator is essential to ensure better results.

The rate of plant growth measured at a wide range of constant temperatures was found to be commonly represented by an asymmetric bellshaped curve (Cooper, 1973). Reviews of the studies of temperature effects on growth of seedlings is often exponential (Cooper, 1973; Nielsen, 1974). Moorby and Graves (1980) reported that the increase of root temperature of tomatoes from 13 to 28°C had always produced an increase in fresh and dry weight. Barlow *et al.* (1977) reported that lowering soil temperature from 27.5 to 15°C caused the elongation rate of corn seedlings to decrease by 45%. Duke *et al.* (1979) reported that the dry weights of roots and shoots of soybean plants grown in the growth chamber were less at lower temperature. The effect of water stress on the growth of the plants is strongly documented in the literature (Meyer and Boyer, 1972; Hsiao *et al.* 1976). Water stress affects the processes of growth by reducing cell division, cell expansion, water uptake, nutrient uptake, synthesis of structural materials and transport of substances between cells. the objectives of this study were: (1) to