

ABSTRACT

Four soil moisture treatments ranging from rewatering the soil at 20% depletion of available water content to 90% depletion were given to well rooted 15 months old cuttings of cacao clone I.C.S. 95 growing in containers in a shaded glasshouse. A detailed study was carried out for about 28 weeks on the effects of these watering regimes on some of the physiological processes including leaf development, flowering, and stem growth and these were then related to the plant-water stress.

There was a high death rate in the drier treatments which was attributed to the combined effects of the salinity of the compost and soil moisture treatments. Soil moisture status was found to affect the plant-water status because as the soil became drier, the relative water content of the leaves decreased. The wetter treatments had a greater total leaf area and total number of flushes for the first 12 weeks of the experiment than those given the drier treatments. A correlation was found between the total dry weight of the surviving plants and the stem diameter measured at soil level.

In the field, it was found that temporary banana shade did not greatly affect air temperature, humidity, distribution of precipitation and the leaf water status of cacao, although solar radiation was reduced to almost 25% by a single layer of banana leaves supported horizontally on grids.

Root examinations suggested that cacao and banana growing together may compete for soil moisture during dry periods.

Recommendations for further work on the water relations of cacao are outlined.