growth, which subsequently produced conidia. The conidia in the honey dew adhering to the infected earhead and on the plant debris germinated to produce mycelium and conidia in subsequent years. Fresh honey dew collected from infected earheads and stored under laboratory conditions for one and two years, when used for inoculation, produced successful infection. These indicated that the conidia were viable up to 24 months. The initial infection through the stigma and style is followed by profuse mycelial growth and colonization inside the ovary. Distinct acervuli with conidiophores and conidia were seen inside the ovary. The conidia are liberated along with sugary exudations from the florets as honey dew.

A large number of sclerotia examined under SEM also showed acervuli containing numerous conidia. Presence of such acervuli even in the mature sclerotium provides evidence to support the view that the conidia from previous years play an important role in the recurrence of the disease.

9 October 1987

A SCREENING METHOD FOR DROUGHT TOLERANCE IN COCOA

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Cocoa trees are extremely sensitive to drought and hence the expansion of its cultivation in Southern India is limited as these areas face periodic droughts. To overcome this difficulty detailed studies were carried out to identify drought-tolerant accessions of cocoa at this Regional Station[1,2]. Although the ultimate test of drought tolerance is the yield stability under drought conditions, it is very expensive involving land, labour and manpower. Any simple and rapid method for large scale screening of germplasm holding and hybrid lines will be of great value. Using the known drought-tolerant cocoa accessions, we have developed a rapid screening method by measuring leaf water potential in excised leaves.

Five 12-year-old drought-tolerant accessions (NC 23, NC 29, NC 31, NC 39 and NC 42) of cocoa (*Theobroma cacao* Linn.) and 4 susceptible accessions (NC 9, NC 49, NC 52 and NC 55) were used. The method was as follows: leaves of cocoa plants (3rd or 4th leaf) were excised and immediately water potential was determined in triplicate for each accession using a Scholander's pressure chamber

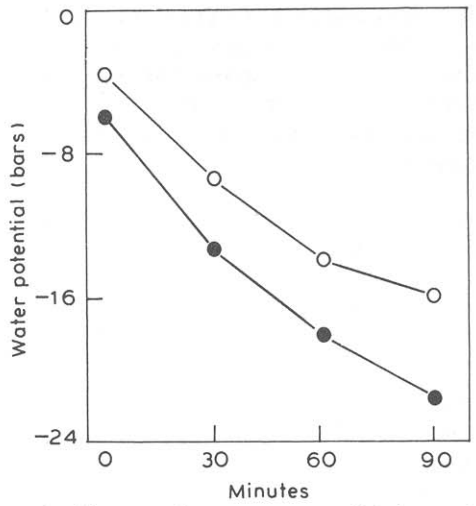

Figure 1. Changes in water potential in excised leaves of tolerant (○) and susceptible (●) trees; the differences significant at 1% level.

(Soil Moisture Equipments Corporation, USA). The excised leaves were then kept in beakers (30 ± 1°C and 68.9% relative humidity) and allowed for air-drying. Water potential was determined in the excised leaves at 30 min intervals up to 1.5 h.

The decrease in water potential was more pronounced in susceptible as compared to tolerant accessions under laboratory stress and the differences were highly significant (figure 1). It has been reported that water potential measurement can be successfully used to screen field grown sorghum genotypes for drought tolerance[3]. The method described here eliminates the difficulty of screening under field conditions in a perennial crop like cocoa. Thus, the method can be employed to upgrade the population for future evaluation under field drought conditions. Drought tolerance in cocoa is characterized mainly by an efficient stomatal regulation reducing transpirational water loss under drought leading to a maintenance of leaf turgor[2].

The authors thank Mr B. P. Nair for statistical analysis.

10 October 1987; Revised 25 November 1987

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