

ABSTRACT

The cultivation of the peanut in the West Indies is discussed, particularly in relation to the two principal foliage diseases, rust caused by Puccinia arachidis and leafspots caused by Cercospora spp. A wide range of susceptibility to infection by these pathogens in local and introduced cultivars is demonstrated. Investigations were undertaken to discover the nature of both horizontal and vertical resistance to rust infection and to determine the mode of inheritance of vertical resistance.

From the studies of horizontal resistance of the peanut to rust infection, a major factor conferring resistance, differential leaf wettability, was discovered. This differential wettability is shown to be correlated with the susceptibility of peanut leaves to rust and to act mainly through its influence on inoculum retention. Leaves become less wettable with age; the absolute wettability also differs between cultivars and is further influenced by age of plant and size of leaf. The discovery of this factor resolves the conflicting reports in the literature on the susceptibility of the adaxial surface of peanut leaves to rust infection. It also explains the previous observations that rust is not seen in the field until peanut plants are approximately six weeks old. A simple technique for assessing the wettability of peanut leaves is described. Such assessments provide a quick screening technique for determining the horizontal resistance to rust infection of peanut cultivars and of lines within cultivars.

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Resistance of peanut cultivars to *Cercospora* leafspots is not appreciably influenced by this differential wettability factor, neither is it influenced to any great extent by stomatal density nor size of the stomatal apertures, as has been suggested in the literature.

The mode of inheritance of vertical resistance to the local rust inoculum by those peanut cultivars studied is shown to be controlled by two duplicate genes with resistance homozygous recessive.