

ABSTRACT

The population development and pathogenicity of Meloidogyne incognita and Rotylenchulus reniformis on various cultivars.

Terry-Ann Robinson

This study determined the pathogenic effects and population development of M. incognita and R. reniformis on various cultivars and examined the nutrient status of these plants growing in the nematode-infested soil, under greenhouse conditions, for six week periods. The elements determined were nitrogen, phosphorus, calcium, magnesium, potassium, sodium, aluminium, manganese, vanadium, cobalt, zinc and iron. Nitrogen and phosphorus were determined colorimetrically and the other elements were determined by Instrumental Neutron Activation Analysis (INAA) at the Centre for Nuclear Sciences, UWI, Mona.

The populations of both nematodes increased on cowpea, callaloo, 'Red' sorrel and corn, with the greatest average rate of reproduction for both nematodes occurring at an initial inoculum level of 100 eggs/larvae per litre of soil. Reproduction was greatest on cowpea, 2.7 and 2.3 and red sorrel, 1.5 and 16.0 and slowest on 'White' sorrel, 0.3 and 1.3 for both M. incognita and R. reniformis, respectively.

Using Hartman and Sasser's (39) root-knot rating index table, 'White' sorrel was found to be the only cultivar resistant to M. incognita. Productivity of the plant was adversely affected only at an initial inoculum level of 10,000 eggs per litre of soil. R. reniformis reproduced on 'White' sorrel, but had the lowest rate of reproduction on this plant. The productivity of the plant was not adversely affected by this nematode.

Corn, cowpea and 'Red' sorrel were found to be susceptible to both M. incognita and R. reniformis, as not only were large numbers of galls produced on those roots infested with M. incognita, but the productivity of the plant was greatly reduced, the reduction increasing with the inoculum density. Callaloo was termed "tolerant" to both nematodes as both nematodes was able to reproduce to high populations on the plant, but productivity and growth was not adversely affected.

Differences in the concentrations of elements due to infestation by these nematodes could be detected as early as one week after infestation. The concentrations of each element in both shoots and roots of the cultivars growing in the infested soil depended on the test cultivar and nematode in question. The concentration of some elements tended to vary over time. Phosphorus was the element least affected by the reniform nematode and potassium and calcium the least affected

by the root-knot nematode.