ABSTRACT

THE EFFECT OF HOST PLANT, INOCULUM RATE, AND SOIL TYPE ON COMPETITIVE NODULATION IN COWPEA (*Vigna unguiculata* (L.) Walp).

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In pot studies, using the soil, St. Augustine loam, kanamycin-resistant mutants of sixteen *Rhizobium* strains were tested for effectiveness in nitrogen fixation and competitive ability for nodulation, in symbiosis with the *Vigna* cultivar, California #5. It appeared that the competitive ability of a *Rhizobium* strain for nodulation was independent of its nitrogen fixing ability.

Competition studies were conducted using three *Rhizobium* strains selected from the sixteen strains tested initially. It was found that high inoculum rates can offset low competitive ability for nodulation in a *Rhizobium* strain. However there appeared to be an optimum inoculum rate for each *Rhizobium* strain above which there was little or no nodulation advantage gained.

Some of the plant genotypes tested in the competition studies were found to exert a greater selective influence for specific *Rhizobium* strains, with which they were more compatible, than for the other *Rhizobium* strains used.

Differences between local soil types did not significantly affect the ability of the three Rhizobium strains to compete for nodulation with the indigenous Rhizobium strains in the different soil types. This implied that local Rhizobium isolates could be used as inoculants in a variety of local soil types with little or no adverse effects on their nodulating efficiency.