A STRAIN-SPECIFIC INEFFECTIVE NODULATION REACTION IN THE SOYBEAN *Glycine max* L. MERRILL¹

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Strain-specific nodulation has been reported in *Medicago sativa* L. by Burton and Wilson (2), Erdman and Means (4), and Gibson (5). Strain-specific ineffectiveness in *Trifolium pratense* L. has been reported by Nutman (7). Bergersen and Nutman (1) reported physiologic factors relating to the failure of the establishment of an effective symbiotic relationship of the bacteria and clover.

In our *Rhizobium* strain evaluation program in the greenhouse at Beltsville and in *Rhizobium japonicum* free soil in Florida, 'Hardee' soybeans, *Glycine max* L. Merrill, inoculated with *R. japonicum* strains of the 3-24-44 and 122 serogroups (3) yielded the same as the uninoculated checks. The root systems of plants inoculated with these strains of bacteria were poorly nodulated. Hardee plants inoculated with other *R. japonicum* strains were normally nodulated.

Twenty-two strains of the 3-24-44 serogroup, and 5 strains of the 122 serogroup were evaluated for their symbiotic effectiveness in the growth chamber. The 22 strains of the 3-24-44 serogroup were a sample of the 38 strains of this serogroup. These strains were collected from diverse locations: Japan, Czechoslovakia, and southeastern United States. The 5 strains of the 122 serogroup represent the entire collection for that serogroup. One strain was collected from Africa. The other 4 strains came from fields in South Carolina and Maryland, and from commercial inoculum.

Surface-sterilized seed were planted in sterilized glass jar assemblies filled with sterile sand. A nitrogen-free nutrient solution was used (6). Plants were exposed to a 16-hr day with 80 F day and 70 F night temperature. Light intensity was approximately 1500 ft-c. Seed were inoculated with a broth culture that had been checked serologically. After 30 days, plant growth and appearance were compared to an uninoculated check and checks inoculated with a known symbiotic effective strain.

Plants began to yellow after 18 days, indicating nitrogen deficiency similar to the uninoculated checks (Figure 1). In some cases the inoculated plants were smaller than the uninoculated checks.

Although plants inoculated with strains of the 3-24-44 serogroups were similar to those inoculated with strains of the 122 serogroup (Figure 1), the nodule development was different (Figure 2). Many small white (tumor-like) but no normal nodules were produced on plants inoculated with strains of the 3-24-44 serogroup. The nodules on the 122 type ineffective plants were normal.

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