Historical and Introductory.

The importance of legumes in the tropics as food plants, as green manures and as cover crops is well known. It is a most important fact that for the production of their most desirable characters these plants require inoculation with legume bacteria followed by efficient nodule production. Legumes are regarded as protein-supplying foods and it is generally accepted that high protein content is very largely bound up with the degree of nodulation. Their efficacy as green manures depends very largely on their ability to produce tops rich in nitrogen, while even when the tops are removed for feeding to farm stock as a protein-rich soiling crop, the roots with their nodules decay in the ground and are a source of nitrogen to the following crop.

The external symptom of efficient inoculat--ion is the production of root nodules in sufficient numbers and in the correct positions in relation to the root system.

Nodules on legumes were first recorded by Malpighi in 1687. He described them as root galls. During the first half of the nineteenth century they were regarded as a pathological condition of the plant and in 1866 Woronin found that the root nodules were filled with Minute bodies resembling bacteria. Hellriegal and Wilfarth proved the real worth of the bacteria by growing legumes in sterilised soil and then adding the leachings from unsterilised soil. The beginnings of artificial inoculation came however in 1888 when Beijerinck isolated the bacteria in pure culture and produced nodules on legumes by inoculation with this culture.

Though at first thought that one species infect--ed all legumes, it was later found that bacteria isolated

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from one type of plant would not always cause nodules to grow on other legumes. From 1914 onwards attempts were made to formulate a scheme of classification. One put forward by Walker (29) in 1928 was generally accepted but for one point. He put the soya bean in a group by itself. Other writers thought that it should be included in the Cow Pea group because it was found that bacteria from the nodules on the roots of soya beans would generally infect the roots of cow peas. This cross-inoculation had been noted by Leonard (21) and it was confirmed by Sears and Carroll (26) in 1927.

In 1934 Carroll put forward a new classification which included the soya bean in the Cow Pea group and in 1935 Walker and Brown (30) published a paper in which they consider that the bacteria of the root nodules of soya bean and of cow pea should be brought together in the same species, Rhizobium japonicum. Examples of the production of nodules on soya beans by the bacteria isolated from cow pea roots are rare, though the reciprocal inoculation is common.