

TECHNICAL NOTES. RESPONSES OF TROPICAL LEGUMES TO INOCULATION.

In the 1953-54 summer season a screening trial of Rhizobium isolates for tropical legumes was planted at Coolum, in the wallum-heath soils of Queensland. This country abounds in native legumes. Those few which have been studied to any extent are recognised as belonging to the cowpea miscellany with respect to cross-inoculation, as do the species used in the trial with the exception of *Glycine max* (L.) Merr.

Treatments consisted of single 11 ft. rows each 4 ft. apart, every third row being an uninoculated control.

The area had a preplanting dressing of dolomite applied at the rate of 2 tons per acre and a fertilizer containing superphosphate, muriate of potash and trace elements.

Prior to inoculation the seeds were surfaced sterilized with 95 per cent. ethyl alcohol for 1 min., followed by 0.1 per cent. mercuric chloride for 10 min., then washed in four changes of sterile distilled water over a period of 20 min. This method has been found very satisfactory in this laboratory.

No measurable differences in plant growth were obtained with *Vigna sinensis* (L.) Endl. ex Hassk., *Phaseolus lathyroides* L., and *Stylosanthes gracilis* H.B.K. Uninoculated plants of these species bore effective nodules as judged by the presence of haemoglobin. Results with other hosts are summarized in Table 1.

Table 1.
RESPONSE OF TROPICAL LEGUMES TO INOCULATION.

Host.	Strain of Inoculum.	Green Yield 11 ft. row. (g.)	Crude Protein. (%)	Presence of Nodules.*
<i>Glycine max</i>	QA 372	700		+
	Control	238		-
<i>Glycine javanica</i>	QA 595	496		+
	Control	25		-
<i>Pueraria phaseoloides</i>	QA 548 b.	2,950	19.4	+
	Control	1,589	14.7	-
<i>Centrosema pubescens</i>	QA 522	2,096	16.7	+
	Control	1,334	10.5	-
<i>Clitoria ternatea</i>	QA 553	2,497	19.5	+
	Control	140	13.5	-
<i>Indigofera hirsuta</i>	QA 468	4,254		+
	Control	3,178		+

* All observed nodulation was effective as judged by the presence of haemoglobin.

The best inoculated treatment is compared with the yield for the adjacent uninoculated row. Green weights only were obtained. Crude protein values for three of the species were determined in the Department's Chemical Laboratory. Protein analyses of *Glycine max*, *G. javanica* L., and *Indigofera hirsuta* L. were not made. With the first two, colour differences were obvious, the uninoculated plants being yellow and the inoculated a deep green. All *Indigofera hirsuta* plants were a deep green.

The fact that all plants of *Phaseolus lathyroides*, *Vigna sinensis*, *Stylosanthes gracilis* and *Indigofera hirsuta* nodulated reflects the presence of naturally occurring legume bacteria for these hosts throughout the trial area. A degree of specificity of *Glycine max*, *G. javanica*, *Pueraria phaseoloides* (Roxb.) Benth., *Centrosema pubescens* Benth., and *Clitoria ternatea* L. is indicated.

In these trials and others, the only nodule pattern observed with *Stylosanthes gracilis* and *S. sundaica* Taub. has been one of numerous pin-head sized nodules scattered over the entire root system. These have been effective as judged by the plant response and by the presence of haemoglobin, although usually at any one time numerous green non-functional nodules can be observed.

G. D. BOWEN,

Plant Pathology Section.
