MODULE 5: DEMONSTRATION 4

QUALITY CONTROL IN INOCULANTS

PURPOSE

- To demonstrate the procedures used for determining the contents of viable rhizobia in sterile and nonsterile peat-based inoculants.

CONCEPTS OF DEMONSTRATION

The quality of an inoculant depends on the number of live and infective rhizobia in it. Enumeration methods require that the inoculant be diluted serially. Several dilutions are then selected for counting. For inoculants based on sterile carriers, aliquots of these dilutions can be spread onto plates containing solid growth medium. The resulting rhizobia colonies can then be counted.

For inoculants based on nonsterile carriers, this method is not practical because other microorganisms present interfere with the plate count. Aliquots of the serial dilution are therefore pipetted onto the roots of seedlings which have been grown aseptically. The nodulation ability of these dilutions will then give information for an estimate of the number of rhizobia present.

RECOMMENDATIONS TO FARMERS FROM RESULTS OF THIS DEMONSTRATION

Knowledge of inoculant quality control procedures is not useful to farmers. It is useful to extension agents to further their basic understanding of inoculants and aid them when discussing distribution and use of inoculant with the inoculant producer.

CONDUCTING THE DEMONSTRATION

An instructor with knowledge of the microbiology of rhizobia is required. See *Methods in Legume-Rhizobium Technology* for details on plate counts and plant infection tests (MPN) to enumerate rhizobia.

Material Requirements:

growth room or chamber

dilution series of inoculant in test tube

a plant infection test with the appropriate species already set up with replications from 10^{-5} to 10^{-11}. This test is based on a high quality inoculant. Inoculant below 1 X 10^{6} rhizobia/g is not useful, therefore, the dilution series does not have to begin until

10^{-5}.

a plant infection test based on a low quality inoculant to simulate exposure to heat. Dilution series in duplicates from 10^{-1} to 10^{-6}. Highest nodulated replication 10^{-5}.

duplicate spread plates showing emergency colonies as a result of 10^{-7} dilution.

Demonstration: The instructor will narrate and explain while showing the following:

1) a dilution series of a peat-based inoculant in test tubes.
2) a completed plant infection test of a high quality inoculant on soybeans in growth pouches.
3) a completed plant infection test of a low quality inoculant on soybean in growth pouches.
4) a completed plate count on YMA in petri dishes.
5) the instructor will briefly discuss the evaluation of the plant infection count and the plate count.