COMPARISON OF XYLEM SOLUTE AND NATURAL ^{15}N ABUNDANCE TECHNIQUES TO ASSESS N_2 FIXATION IN SOYBEAN (*GLYCINE MAX.*)

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ABSTRACT

A field experiment was conducted at Research Farm of University of Arid Agriculture, during Kharif, 1997. N_2 fixation in soybean by xylem solute and natural ^{15}N abundance techniques with and without inoculated seeds and with and without N application was assessed .The soybean was planted to see nitrogen contribution with reference to non legume (maize) crop. Soil samples were collected and analyzed for various physical and chemical properties, NO_3-N and soil moisture before and after the experiment. Data regarding various crop characteristics including grain yield was recorded and subjected to statistical analysis. The results of the study indicated that the soybean with inoculation had highest number of nodules under unfertilized conditions. The comparison of %Pfix (the proportion of plant N derived from N_2 fixation) both (%RUN) and (delta ^{15}N) showed that the xylem solute and natural ^{15}N abundance techniques gave independent estimates of % Pfix. Higher % Pfix was obtained in soybean with inoculation by both techniques. Maximum nitrogen of 45.0 kg ha^{-1} was fixed with the inoculated soybean, and 39.0 kg ha^{-1} under unfertilized condition.