5. SUMMARY

This study on heterotrophic nitrogen fixation in the rhizosphere of foxtail millet is concerned with the following aspects:

0 Isolation and estimation of the population of bacteria from the rhizosphere of foxtail millet.
0 Screening of the bacterial isolates for diazotrophs.
0 Evaluation of nitrogen fixation by the isolates of bacteria obtained from the rhizosphere of foxtail millet using the spermosphere model.

Results indicated that rhizosphere soil exhibited significantly higher population of bacteria compared to the non-rhizosphere soil. The rhizosphere effect was more pronounced during the early part of plant growth i.e. upto 45 days. The population of bacteria declined thereafter in both rhizosphere and non-rhizosphere samples which was more pronounced in non-rhizosphere samples.

Of the 67 bacterial isolates obtained from the rhizosphere and non-rhizosphere only 22 (about 33%) were
rhizosphere and non-rhizosphere only 22 (about 33%) were diazotrophs. However, these isolates exhibited significant nitrogen-fixing activity. A majority of the diazotrophs were isolated from the rhizosphere of foxtail millet. Evidently, isolates obtained from the rhizosphere were more efficient in nitrogen fixation.

Evaluation of nitrogen fixation by the selected isolates was carried out in the spermosphere model. The most abundant seeds, in terms of seed weight, were used to minimise variability. Results indicated that the isolates exhibited higher nitrogen-fixing potential in the spermosphere model compared to conventional media. A significant increase in nitrogen fixation was exhibited by all the isolates at the end of second week (14 days). Further incubation led to a decline in nitrogen fixation by all the isolates which was not below that observed by the end of first week (7 days) in the spermosphere model.