Nodulation and arbuscular mycorrhizal infection was assessed in soils obtained from two habitats of *Faidherbia albida* in different ecoclimatic zones. A third site in a semi arid area but without *F. albida* was also assessed. All three sites had *Bradyrhizobium spp*, *Rhizobium spp* and arbuscular mycorrhizas. Soils from the two sites with *F. albida* differed in soil mineral content, nodulation and mycorrhizal infection of *F. albida* and *Acacia senegal*.

In laboratory experiments it was observed that *F. albida* took about 21 days to nodulate. Inoculated seedlings suffered an early period of nitrogen stress. Application of combined nitrogen alleviated early nitrogen stress but reduced nodulation and nitrogen fixation. Combined nitrogen in form of $NG4^{+}$ had less severe effects on nodulation than $NO3^{-}$ at the three levels of N (0.5, 2.5 and 5.0 mol m^{-3}) tested.

In an experiment using 5.0 mol m^{-3} N provided as $^{15}NO3^{-}$ (5 atom %) or as $^{15}NH4^{+}$ (5 atom %) it was established that preference for nitrogen form was pH dependent. Nitrate was preferred at low pH (5.5) and ammonium at high pH (6.5). The N form/pH combination resulting in good plant growth had also less severe effects on nodulation and nitrogen fixation.

Improvised glass fronted gutter containers, made from open gutter pipes were used for monitoring taproot elongation. Effect of $N2$, $NO3^{-}$, and $NH4^{+}$ at mol m^{-3} was assessed. The taproots elongated very quickly but independently of nitrogen for at least the first 70 days. There were also no statistical differences between taproot elongations in three provenances of *F. albida* tested.

In an experiment to find out the effects of phosphorus and nitrogen form of *F. albida*, phosphorus was found to increase nodulation and nitrogen fixation. High levels (above 3.0 mol m^{-3}) of phosphorus reduced plant growth, nodulation and nitrogen fixation. A statistically significant interaction was observed between nitrogen form and phosphorus levels. The contribution of arbuscular mycorrhizas to growth, nodulation and nutrient uptake in *F. albida* seedlings at 0.2, 0.5 and 1.0 mol m^{-3} was not statistically significant.

There were no statistically significant differences between *F. albida* seedlings grown at 0.5, 50.0 and 75.0 mol m^{-3} NaCl. Percent nitrogen and nitrogen content were statistically lower in plants grown at 75.0 mol m-3. However the ratio of carbon to nitrogen was significantly higher in plants grown at 75.0 mol m^{-3} compared to 0.5 and 50.0 mol m^{-3} NaCl.

It has been shown in this study that nodulation, nitrogen fixation and growth of *F. albida* is influenced by nitrogen form and levels, phosphorus levels, pH and salinity. It is also evident from the results that agronomic protocils can be designed to militate against conditions adverse to growth and nitrogen fixation of the tree. It is envisaged that change of agronomic practices in the growth of *F. albida* coupled with selection of both macro and micro-symbiont for the field conditions will improve growth and nitrogen fixation of the tree.