

THE USE OF W^o MICRO BIOSENSOR TO MEASURE THE SITE-SPECIFIC pH CHANGES IN THE RHIZOSPHERE OF *LUPINUS SILVESTRIS* FERTILIZED WITH DIFFERENT SOURCES OF P

Muhammad Akhtar*, V. E. Hernandez*, A. Baeza*,
A. M. Qazi** and R. N. Escobar*

ABSTRACT

Phosphorus deficient supply enhances *Lupinus* root secretions in the form of organic acids that lower down the soil pH. The rhizosphere pH change was determined in a green house experiment by the use of a micro-potentiometry system based on a W^o pH electrode and Cu/Cu(II)H₂O reference electrode. A linear Nikolsky type response was obtained, $y = -43.39X - 44.86$, $R^2 = 0.9962$. Total microscale acid base titrations showed the response of $E = f(\text{pH})$. The rhizosphere pH change was calculated during 6 weeks starting from 21 day old plants. The pH decrease by the wheat was negligible compared to that of *Lupinus*. The decrease measured in control (P0) was prominent by *Lupinus* either growing alone (22.3%) or in association with wheat (25%). However, the water-soluble fertilizer (TSP) depressed the acidification process and the pH reduction was only up to 14.9%, while the sparingly soluble P compound had no effect.

Key Words: Micro-biosensor, Rhizosphere pH, *Lupinus Silvestris*.