

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

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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 $E = f(pH)$. 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.