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## **ROOT COLONIZATION OF A NATIVE PHOSPHATE SOLUBILIZING BACTERIA AND EFFECT OF ITS INOCULATION ON PEANUT (*Arachis hypogaea* L.) AND MAIZE (*Zea mays* L.) YIELD**

Bernardi, Paula - Lopez, Agustín - Loser, Ursula - Morla, Federico - Taurian, Tania, Anzuay, María Soledad

Instituto de Investigaciones Agrobiotecnológicas (INIAB, CONICET-UNRC, Río Cuarto, Córdoba, Argentina)

Contacto: manzuay@exa.unrc.edu.ar

Argentina is one of the world's leading peanut exporter and producer and about 90% of this production takes place in the Province of Córdoba. In this agricultural region the maize crop is used in rotation with this legume. In peanut production area of Cordoba low values of available phosphorus (P) content were reported. A sustainable strategy to solve this problem is the use of phosphate solubilizing bacteria (PSB) as P-biofertilizers. These bacteria improve the mobilization and availability of soil P for plant nutrition. The field application of biological inoculants as PSB requires an efficient root colonization by these bacteria and thus is a desirable property in the search for potential biofertilizers. The objectives of this study were to evaluate the root colonization of a native PSB and the effect of its inoculation on the yield of peanut and maize plants. Early colonization capacity of the native phosphate solubilizing strain *Pseudomonas* sp. SAS7 was assessed by counting bacterial cells over and inside of root tissues of peanut and maize plants. For this, 7 days peanut and maize plantlets grown in pots containing non-sterile soil mixed with perlite in a 2:1 (v/v) ratio were inoculated with this strain and maintained in a growth camera with controlled conditions. At the time of harvest, 45 dpi for peanut and 21 dpi for maize, the presence of epiphytic and endophytic bacteria in the roots of both plants was determined. To confirm that the colonies obtained corresponded to the inoculated strain, genetic profile analysis was performed using the rep-PCR technique. Field trials were conducted in the agricultural area of Córdoba on soils with low P content and on peanut or maize seeds. The following treatments were applied: 1. Seeds inoculated with the native BSP *Pseudomonas* sp. SAS7; 2. Seeds inoculated with *Pseudomonas* sp. SAS7 and grown in soil fertilized with half dose of chemical fertilizers; 3. Seeds grown on soil with full dose of fertilizer; 4. Control, uninoculated and unfertilized seeds. All treatments with peanut plants were inoculated with the commercial microsymbiont strain *Bradyrhizobium* sp. SEMIA 6144. At the time of harvest, on each crop, its main numerical components and yield were evaluated. The result obtained indicated that the BSP strain SAS7 showed epiphytic colonization on peanut and maize plants in the microcosm assay. Results of field trials indicated, although not statistically significant, increases of grain yield (Kg ha<sup>-1</sup>) in peanut plants with the three treatments analyzed, compared to control plants. On the other hand, maize plants inoculated with native strain SAS7 (T2) significantly increased the yield

respect to control plants (32%). The native strain *Pseudomonas* sp. SAS7 is a PSB with beneficial effect on peanut and maize crops and could be employed in the formulation of biofertilizers.

Palabras clave: Phosphate solubilizing bacteria – peanut – maize – colonization – yield