

Effectiveness of indigenous pea rhizobia (*Rhizobium leguminosarum* bv. *viciae*) in cultivated soils of central Kenya

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Original submitted in on 25th May 2012. Published online at www.m.elewa.org on 30th September 2012.

ABSTRACT

Objective: This paper reports on a study conducted to determine the effectiveness of pea rhizobia (*Rhizobium leguminosarum* bv. *viciae*) resident in Central Kenyan soils.

Methodology and results: Garden pea (*Pisum sativum* cv. Plum) grown in pots containing soils collected from 26 sites, with and without a history of pea cultivation, in central Kenya was inoculated with a commercial rhizobial strain, supplied with 74 mg N pot⁻¹, or did not receive any treatment (control).

Rhizobial inoculation enhanced pea nodule numbers in soils from some sites that had no history of pea cultivation. Nitrogen fertilizer depressed pea nodulation in soil samples from all sites. Most abundant active and total nodules (20 and 22 nodules plant⁻¹) were recorded in sites with adequate soil N, high organic carbon and history of pea cultivation. In many cases, plants in untreated soils had a high nodule number and accumulated more shoot biomass than plants growing in inoculated or nitrogen supplied soil. This confirmed the N₂ fixation efficiency of indigenous pea rhizobia strains. Plants that had poor nodule formation were those growing in soils from a site in Nyeri that was low in soil N and organic carbon. **Conclusion and application:** Most soils in Central Kenya have abundant and efficient native strains of pea rhizobia irrespective of pea cultivation history. In some sites, indigenous rhizobia out-performed the commercial inoculant strain. Thus, it is advisable to screen indigenous pea rhizobia strains in the target sites for N₂ fixation efficiency with the objective of making more effective inoculants. Improvement in soil organic carbon in Central Kenya can enhance the benefits accruable from pea N₂ fixation. A similar study involving a broad range of pea genotypes and strains of *Rhizobium leguminosarum* bv. *viciae* is recommended.