
Sustainable intensification of grain legumes with smallholders in Africa through nitrogen fixation: highlights from the N2Africa project

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Improving Nitrogen Fixation in grain legumes is central to the sustainable intensification of agriculture in sub-Saharan Africa (SSA) and inoculation with effective rhizobia can make an important contribution to this goal. Genetic and phenotypic studies have identified large taxonomic diversity and differences in symbiotic effectiveness between isolates from SSA soils, suggesting that there is potential for developing more effective inoculants from native bacteria. The N2Africa project has pursued two approaches in this regard: First, identification of elite strains from native rhizobial collections with the aim of developing inoculants for local production in SSA and second, promotion of inoculation with effective bacterial strains at scale. Here, we report the genetic and symbiotic diversity of indigenous isolates, success with the search for elite strains and achievements of the project in getting the inoculant technology out to farmers at a larger scale through Private Public Partnership (PPP). Response of crops to inoculation across a large number of smallholder's farms, covering diverse soil fertility and agro-ecological conditions, was evident. Commonly, increased grain yield of >10% over yield on control plots (a yield level assumed to be visible to farmers) was realized for most farmers. However, observed grain yields on control plots and responses to inoculation on individual farms varied greatly with a relative yield responses ranging from 3% - 100%. The additive benefits and possibilities for a wide scale promotion of inoculant technology to smallholders through a PPP approach will be discussed.

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