



TRansition paths to sUstainable legume-based systems in Europe

Selecting elite rhizobial strains compatible with Common bean (*Phaseolus vulgaris*) varieties for Biofertilizer production

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Background information

Legumes and rhizobia have the ability to select their symbionts alike. This is achieved through the complex biochemical signaling pathways that determine symbiotic specificity between rhizobia and the prospective hosts. The common bean is considered a promiscuous host that can nodulate with several rhizobia species. However, the effectiveness of these strains under most field conditions is low in tropical soils. Also, different varieties of common beans vary in their ability to form effective nodules and capacity to fix atmospheric nitrogen. It is therefore essential to select and match effective rhizobia with compatible bean varieties and the prevailing pedo-climatical conditions.

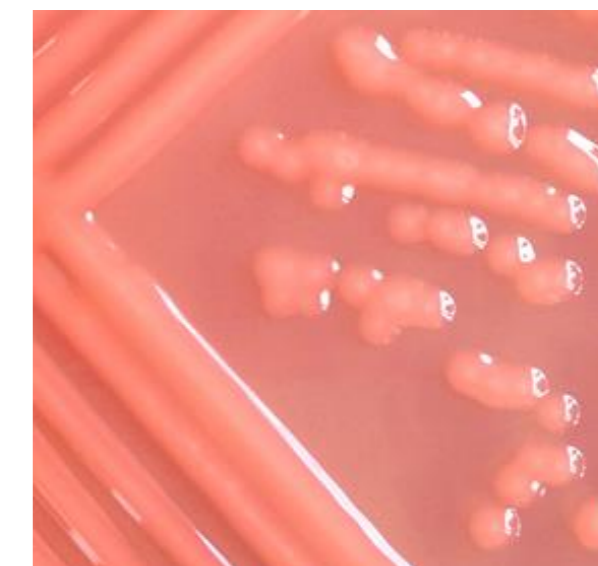
Selecting elite rhizobial strains



Common bean rhizobia Biofertilizer



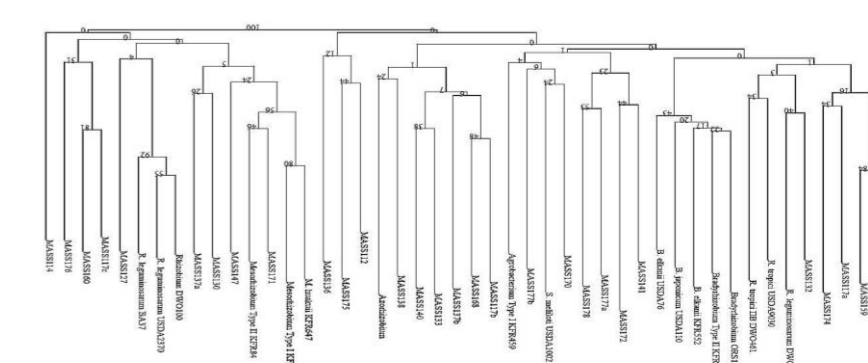
Root nodules containing one or various rhizobial strains



Rhizobia isolates on YMA media



Selection for elite rhizobia strains for *Phaseolus vulgaris*



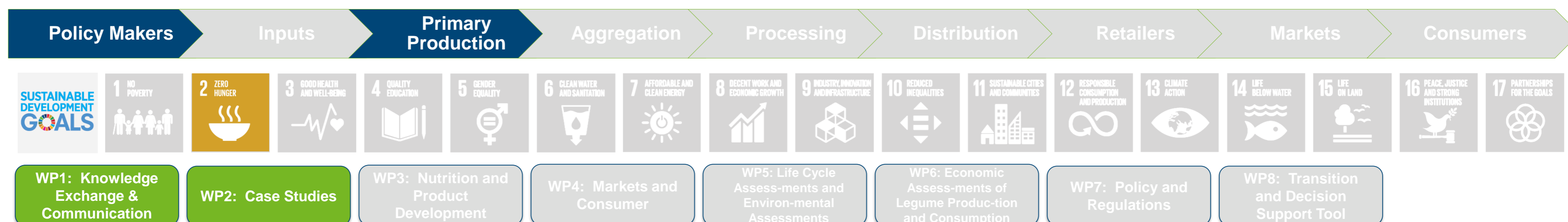
Identification of rhizobial genotypes

Conditions that call for inoculation

- Low soil nitrogen
- Few or no nodules on roots of previous legume crop of the same species
- Low population of elite rhizobia strain
- High population of ineffective strains
- New legume crop

Output

- Rhizobial characterization (Phenotypes and genotypes)
- Nitrogen fixation efficiency tests
- Legume inoculation field trials
- Legume Bio-fertilizer production



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