



Using of beneficial soil microorganisms to improve the seed yield and quality of *Phaseolus vulgaris* in a reduced fertilization condition

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Abstract:

Phaseolus vulgaris is a legume able to form symbiotic associations both with arbuscular mycorrhizal fungi (AMF) and Rhizobium bacteria. *Phaseolus vulgaris* cv. Billò is an important and valuable crop widely cultivated in North-Western Italy. AMF are known to improve plant nutrition, in particular phosphorus and nitrogen acquisition, and hence seed quality. Rhizobium leguminosarum is a gram-negative bacterium, symbiont of various species of Fabaceae that is able to fix atmospheric nitrogen. The aim of this work was to check, in field conditions, the possibility to improve bean seed yield and quality by means of inoculation with AMF and/or rhizobia under conditions of low fertilization. First fifteen different Rhizobium strains were isolated from root nodules or soil and characterized by molecular and biochemical traits. One of these strain was selected and used with AMF for a field trial. At harvesting, root nodulation and mycorrhizal colonization were assessed and seed quality parameters were evaluated. Yield parameters and fiber content were not influenced by microorganism inoculation nor by the reduced fertilization, whilst protein concentration was higher in the seeds of Rhizobium-inoculated plants in combination or not with AMF. Starch concentration increased in the seeds of plants inoculated with rhizobia alone. Mg, K and Zn concentrations were positively affected by AMF, while Mn concentration was higher



in the presence of Rhizobia. In conclusion, an environment-friendly practice like low chemical fertilization can be associated to inoculation with soil microorganisms in order to improve bean seed quality.

Biography:

Patrizia Cesaro is a researcher at the Università del Piemonte Orientale “Amedeo Avogadro”, Italy. Her research has been focused in plant science, she has a good expertise molecular biological techniques. Since 2011, Professor of Molecular Biology.

Recent Publications:

1. Using of beneficial soil microorganisms to improve the seed yield and quality of *Phaseolus vulgaris* in a reduced fertilization condition