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Synergistic effects of arbuscular mycorrhizal fungi and *Rhizobium* on plant growth, yield and resistance to charcoal rot of green gram [*Vigna radiata* (L.) Wilczek]

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Low cost biofertilizers for disease management options need to be optimized if yields are to be sustained and food security attained. In the present study, field experiments were conducted to investigate the synergistic effects of arbuscular mycorrhiza, *Glomus constrictum*, nitrogen fixing bacteria, *Rhizobium* spp. and charcoal rot pathogen, *Macrophomina phaseolina* on green gram in relation to plant growth, nodulation, nutrient uptake, seed yield and influence on charcoal rot disease incidence. The pathogen inoculated plants reduced all plant responses monitored and were significantly lower in uninoculated control plants. *Glomus* plus pathogen inoculated plants yielded greater plant dry weights, phosphorus, potassium content and seed yield followed by *Rhizobium* plus pathogen inoculated plants compared to only pathogen inoculated and control plants. The nodule number, dry weight, nitrogen content of the root nodules in *Glomus* plus *Rhizobium* treatments in the presence of pathogen were significantly more compared to *Rhizobium* plus pathogen inoculated plants. In *Glomus* with pathogen treatments, the percentage root colonization was recorded to be 58.45%. Co-inoculation of two symbionts with pathogen enhanced root colonization ability to 80.64%. Inoculation of two symbionts in combination with the pathogen significantly reduced charcoal rot disease incidence as compared to pathogen inoculated in combination with only one symbiont either *Glomus* or *Rhizobium*. However, the plants in the presence of *Glomus* and *Rhizobium* were more tolerant to fungal root pathogen, *M. phaseolina*. The results indicate that inoculation with two symbionts in combination is more beneficial in management of root rot pathogen in green gram.

Biography

B N Reddy has Published 75 research papers, contributed chapters in books brought out by reputed publishers. He is the author of *Systematics and Occurrence of Arbuscular Mycorrhizal Fungi* brought out by Lap Lambert Academic Publishing. He has presented 114 research papers at national and international conferences, organized 14 seminars/conferences, delivered Plenary Lectures on invitation in the international conferences/symposia held in Austria, China, Germany, Hungary, Italy, Malaysia, Mexico, Turkey, USA and interacted with many Nobel Laureates.

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