

## EFFECT OF INOCULATION WITH RHIZOBIUM AND VA-MYCORRHIZAE ON PEANUT ROOT ROT DISEASES UNDER DIFFERENT SOURCES OF PHOSPHORUS FERTILIZER

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### ABSTRACT

**Greenhouse** and field studies were conducted in 2006 and 2007 to study the effect of peanut inoculation with rhizobium and/or VA-mycorrhizae on peanut root rot diseases under different sources of phosphorus (P-rock and P-super). Application of rhizobium and/or mycorrhizae as a biofertilizer gave significant reduction in the incidence of damping-off and peanut root rot diseases and consequently increasing percentage of healthy survival plants and total peanut pod yield under greenhouse experiments and field studies during seasons 2006 and 2007. The effect of mycorrhizae was more effective than rhizobium on reduction of the studied diseases when used singly. Combination of both biofertilizers with phosphorus treatment recorded the highest reduction of damping-off and peanut root rot incidence and integration of P-rock, rhizobium and mycorrhizae gave the maximum diseases reductions compared with other treatments in greenhouse experiments and field studies during the two seasons. Using both of rhizobium and mycorrhizae together increased nodule number and dry weight and also increase of mycorrhizae infection percent and their spore numbers as well as using of them singly or together led to increasing the percentage of P in the soil whereas total or available P and also increased P and N contents in peanut plants. Generally, P-rock as a source of phosphorus was more effective than P-super in all previous parameters in greenhouse experiments and field studies during the two growing seasons 2006 and 2007.

Key words: Peanut, Rhizobium, VA-mycorrhizae, *Fusarium solani*, *Macrophomina phaseolina*, *Rhizoctonia solani*, *Sclerotium rolfsii*, Damping-off, Root rots, P-sources.

### INTRODUCTION

Damping - off and root rot diseases are among the most destructive diseases attacking peanut in Egypt (Hussin, 2005 and Metwally *et al.*, 2006). These diseases also affect plant stand in the field, plant growth and seed yield (Hilal *et al.*, 1990 and Hussin, 2005).

Peanut, like most other herbaceous plants, is commonly infested with vesicular-arbuscular mycorrhizal fungi (Porter *et al.*, 1990 and Allen *et al.*, 2003). Species of *Glomus*, *Gigaspora*, *Acaulospora*, and *Sclerocystis* are the most commonly observed VAM

associated with peanut (Porter *et al.*, 1990 and Kulkarn *et al.*, 1997). The vesicular arbuscular mycorrhizal (VAM fungi) and their associated interactions with plants can reduce the damage caused by plant pathogens by forming symbiotic relationship with their host by colonizing the cortical region of feeder roots both inter- and intracellularly (Siddiqui *et al.*, 2008). They benefit the host plant primarily by increasing the capability of the root system to absorb and translocate phosphorus and microelements through an extensive network of hyphae external to the root (Carling *et al.*, 1996 and Siddiqui *et al.*, 2008). These