

## 大豆/玉米间作体系中接种AM真菌和根瘤菌对氮素吸收的促进作用

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Nitrogen uptake facilitation in soybean/maize intercropping system inoculated with rhizobium and arbuscular mycorrhizal fungi

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摘要

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**摘要** 利用大豆和玉米之间根系不同分隔方式的盆栽试验,研究了在玉米/大豆间作体系中接种大豆根瘤菌、AM真菌*Glomus mosseae*和双接种对间作体系氮素吸收的促进作用。结果表明,双接种处理显著提高了大豆及其间作玉米的生物量、氮含量,双接种大豆/玉米间作体系总吸氮量比单接AM菌根、根瘤菌和不接种对照平均分别增加22.6%、24.0%和54.9%。大豆促进了与其间作玉米对氮素的吸收作用,在接种AM真菌和双接种条件,间作玉米的AM真菌侵染率提高,大豆根瘤数增加;接种AM真菌处理,不分隔和尼龙网分隔比完全分隔玉米吸氮量的净增加量是未接种对照的1.8、2.6倍,双接种处理分别是对照的1.3和1.7倍。说明在间作体系中进行有效的根瘤菌和AM真菌接种,发挥两者的协同作用对提高间作体系土壤养分利用效率,进一步提高间作体系的生产力有重要的意义。

**关键词:** 大豆/玉米间作 大豆根瘤菌 吸氮量 AM真菌

**Abstract:** Pot experiments with different root barriers between maize and soybean were carried out to investigate the effects of rhizobium, arbuscular mycorrhizal fungi and interaction of rhizobium and arbuscular mycorrhizal fungi on nitrogen uptake in a soybean/maize intercropping system. The results show that under the dual inoculation with *Glomus mosseae* and soybean rhizobium SH212, biomasses, nitrogen contents of soybean and associated maize are significantly increased. On the average, the nitrogen uptakes by soybean/maize intercropping system inoculated with both microorganisms are increased 22.6%, 24.0% and 54.9% compared to those of the inoculated with arbuscular mycorrhizal fungi, rhizobium and control respectively. Soybean facilitates nitrogen uptake of the intercropping maize. Arbuscular mycorrhizal colonization of the intercropping maize and nodule numbers of the intercropping soybean are increased significantly. These are the main reasons that net increases of nitrogen uptake by maize under the mesh barrier and no barrier treatments are 1.8 and 2.6 times than that of the control. And the net increases of N uptake by maize under the dual inoculation treatments are 1.3 and 1.7 times than that of the control respectively. These results suggest that the inoculation with both microorganisms in the intercropping system could improve soil nutrition efficiency and enhance productivity of the intercropping system by the synergy effects of rhizobium and arbuscular mycorrhizal fungi.

**Keywords:** soybean/maize intercropping soybean rhizobium nitrogen uptake arbuscular mycorrhizal fungi

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