

## 不同施肥量条件下AM真菌对烟苗生长及营养状况的影响

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## Influences of arbuscular mycorrhizal fungi on growth and nutrition of tobacco seedlings under different fertilizer levels

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**摘要** 试验设置不同施肥量,于播种期分别接种根内球囊霉菌 (*Glomus intraradices* Smith和Schenck, BEG193)和幼套球囊霉菌 (*Glomuse etunicatum* Becker和Gerdemann, BEG168),探索了利用烤烟漂浮育苗技术生产菌根化烟苗和培育壮苗的可能性。结果表明:随着养分供应量的减少,AM真菌的侵染率提高,BEG193的侵染率高于BEG168。减施肥料总体上抑制烟苗生长,使烟苗生物量降低;但接种AM真菌显著促进烟苗生长,烟苗平均生物量比不接种的处理增加了74.38%(BEG168)和48.32%(BEG193)。接种BEG168使烟苗氮、磷、钾含量显著增加;接种BEG193主要是提高了烟苗含磷量。在施肥量减少75%辅以少量追肥的情况下,接种BEG168之后,烟苗生长状况和磷、钾含量超过或与常规施肥的非菌根苗相似。因此,在集约化烤烟漂浮育苗过程中,可采用接种AM真菌BEG168的方式培育壮苗,同时降低施肥量,减轻废弃营养液产生的环境污染。此外,接种AM真菌显著提高基质中的酸性磷酸酶活性,菌根苗基质中的磷酸酶活性随施肥量的降低而逐渐升高。因此,接种AM真菌有益于基质中有机磷的吸收利用,这可能是菌根烟苗含磷量提高的重要原因之一。

**关键词:** AM真菌 烤烟 生长 营养

**Abstract:** Tobacco seedlings were inoculated with and without arbuscular mycorrhizal fungi(AMF)at the sowing stage and grown in the culture boxes floating on the nutrient solutions to investigate the possibility of producing mycorrhizal and healthy seedlings. AMF used in the present experiment were *Glomus intraradices* Smith and Schenck(BEG193) and *Glomuse etunicatum* Becker and Gerdemann(BEG168). The results show that the colonization rate of BEG193 is significantly higher than that of BEG168, and both of them are increased as the concentrations of nutrients in solution are decreased. The growth of tobacco seedlings is also increased significantly by the fungal inoculation, but is inhibited generally in solution with low nutrient concentrations. The average biomasses are increased by 74.38%(BEG168)and 48.32%(BEG193), respectively, compared to the control(without inoculation). The phosphorus concentration in the seedlings are increased with BEG193 inoculated, and the contents of nitrogen, phosphorus and potassium are increased with BEG168 inoculated. It is necessary to point out that the biomass and contents of phosphorus and potassium in BEG168 infected seedlings grown in nutrient solution with 75% of nutrients removed plus small amount of dressing are similar to or higher than those of the non-mycorrhizal ones cultured in the normal nutrient solution. Healthy tobacco seedlings could thus be produced by BEG168 inoculation grown in nutrient culture solution with less fertilization, by which could reduce greatly the amount of fertilizer for seedlings culture and alleviate environmental pollution produced by nutrient solution abandoned. Moreover, under the inoculation of AM the activities of phosphase are increased in the culture medium, and are enhanced as the amount of nutrient supplies is deceased. Therefore, the inoculation of AM could promote the utilization of organic phosphorus in the culture medium and resulted in the increment of phosphorus concentration in tobacco seedlings.

**Keywords:** arbuscular mycorrhizal fungi flue-cured tobacco growth, nutrition

Received 2009-12-04; published 2010-04-20

Fund:

贵州省烟草专卖局重大科技项目 [2006-04]; 国家烟草专卖局项目 [110200401011] 资助。

**引用本文:**

李建伟1, 2, 江龙3, 袁玲2, 黄建国2\*.不同施肥量条件下AM真菌对烟苗生长及营养状况的影响[J] 植物营养与肥料学报, 2010,V16(5): 1190-1195

LI Jian-Wei-1, 2, JIANG Long-3, YUAN Ling-2, HUANG Jian-Guo-2\*. Influences of arbuscular mycorrhizal fungi on growth and nutrition of tobacco seedlings under different fertilizer levels [J] Acta Metallurgica Sinica, 2010,V16(5): 1190-1195

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