

Sangdow Bubphasi 2006: Effects of Arbuscular-Mycorrhiza Fungi and Nitrogen-Fixing Bacteria on Growth of Sorghum (*Sorghum bicolor* Linn.). Master of Science (Botany), Major Field: Botany, Department of Botany. Thesis Advisor: Associate Professor Sombun Techapinyawat, Ph.D.  
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The effects of arbuscular-mycorrhiza, nitrogen-fixing bacteria, and urea fertilizer on sorghum growth were determined. Sorghum seeds were germinated in pots using fumigated Pakchong soil and inoculated with three different species of mycorrhiza, two species of nitrogen-fixing bacteria and three levels of urea. After 4 months of growth, sorghum plants grown in *Acaulospora scrobiculata* supplemented soil had the highest shoot weight (39.88 g/plant) and the highest percentage of phosphorus in the root (0.203 %). Inoculation with *A. spinosa*, however, gave the highest average biomass (69.76 g/plant), while the highest percentage of potassium in the shoot (3.114 mg/plant) was obtained from those grown in the soil with all three species of arbuscular-mycorrhiza, Mmix (*A. spinosa* + *A. scrobiculata* + *Scutellospora* sp.)

Combining arbuscular-mycorrhiza with nitrogen-fixing bacteria gave different results, *A. scrobiculata* and *Azospirellum* supplemented soil gave the highest spore numbers of 20.75 spore/g, and highest arbuscular-mycorrhiza root colonization (44.40 %), highest percentage nitrogen in the shoot (0.795 %) and in the root (0.519 %) and total uptake of nitrogen in the shoot (31.01 mg/plant). Whereas *Scutellospora* sp. + Bmix (*Azotobacter* + *Azospirellum*) soil gave the highest percentage of potassium in the root (1.387 mg/plant). Using urea fertilizer at the level of 15 kg urea/rai, together with *A. scrobiculata* + *Azospirellum* gave the highest plant height (92.50 cm) and highest head weight (19.19 g/plant). On the other hand, having *A. spinosa* + *Azotobacter* and 15 kg urea/rai, the highest uptake of potassium in the shoot (943.51 mg/plant) of sorghum was obtained. When using higher amount of urea (30 kg urea/rai) with *A. scrobiculata* + *Azospirellum*, the shortest day of flowering (96.50 day) was achieved, whereas *A. scrobiculata* alone gave the highest leaf number (10.88 leaves/plant), root growth (15.51 g/plant), total uptake of nitrogen (7.775 mg/plant), phosphorus (31.36 mg/plant) and potassium (182.45 mg/plant) in the roots. *A. spinosa* gave the greatest leaf area (367.32 cm<sup>2</sup>/leaf) and highest total seed weight (14.16 g/plant), and 1000 seed weight (39.04 g/plant) of sorghum. While Mmix treated plant gave the highest percentage of phosphorus (0.395 %) and uptake of phosphorus (145.94 mg/plant) in the shoots (145.94 mg/plant).

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