

A field experiment was conducted at the Demonstration Farm of the Faculty of Agriculture, University of Khartoum in Shambat during the period December, 1997-June 1999 to investigate the effects of *Rhizobium meliloti*. Vesicular arbuscular mycorrhiza (VAM), and their combinations on plant density and seed production of two alfalfa cultivars (local Hegazi and imported Pioneer 5929). The treatments consisted of Rhizobium inoculation, VA-Mycorrhizal inoculation, a combination of R+VAM, and a reference check as a control. A split plot design, with cultivars in the main plots and microorganisms in the subplots, was used. The microorganisms (bacteria and fungi) alone or in combination significantly improved plant density and seed yield of the two cultivars. Rhizobium increased total seed production over the control by 33%. Corresponding increments for the VAM alone and in combination with Rhizobium were 49.5% and 46%, respectively. The local cultivar Hegazi out-yielded the introduced Pioneer 5929 in seed yield components and total seed yield and significantly produced more plants per unit area compared to the introduced one. It produced 21% more seeds compared to the Pioneer 5929 variety.