

Kamolrat Vinijsakulthai 2009: Effects of Vesicular-Arbuscular Mycorrhizal Fungi: *Glomus aggregatum* and Fertilizer on Growth and Yield of Physic Nut (*Jatropha curcas* Linn.) in Irrigated and Rainfed Area. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Sombat Chinawong, Ph.D. 91 pages.

The objective of this study is to investigate the appropriate utilization of chemical fertilizers with the inoculation of vesicular-arbuscular mycorrhizal fungi (*Glomus aggregatum*) for the physic nut planted in an irrigated and a rainfed area by comparing their growth and yield. The experiments were the split split plot designed in RCB with 3 replications, where the irrigated and the rainfed cultivated area were set as a main plot, the inoculation and non-inoculation of mycorrhizal fungi were considered as a sub plot, and for a sub sub plot, the utilization of chemical fertilizer (15% of N, 15% of P and 15% of K) was taken into account by varying the apply rates of 0, 25, 50 and 75 kg.rai⁻¹. All these experiments were achieved at the Department of Agronomy, Kasetsart University, Kamphang Saen Campus, during the January-December, 2008.

According to the experiments, the results showed that the irrigated area stimulate the growth and yield of physic nut in terms of their stem diameter, shoot weight, fruit weight, and seed weight better than the rainfed area. Moreover, the effect of the inoculation of mycorrhizal fungi could increase a number of branches, root weight, shoot weight, fruit weight, and seed weight, as well as, 100 seed weight of the studied physic nut when comparing with the non-inoculated group. Then, by applying at different rates, the chemical fertilizer usage at the rate of 25 kg.rai⁻¹ gave the highest shoot weight, fruit weight and seed weight. From the study, the usage of chemical fertilizer at the rate of 25 kg.rai⁻¹ to the plants in the irrigated area gave the highest fruit weight and seed weight. However, the irrigated area and the mycorrhizal fungi inoculation could stimulate the plants in the aspects of root weight and shoot weight. Moreover, the inoculation of mycorrhizal fungi together with the chemical fertilizer at the rate of 25 kg.rai⁻¹ had the highest seed weight. Thus, the inoculation of mycorrhizal fungi and the chemical fertilizer at the rate of 25 kg.rai⁻¹ tend to stimulate yield of physic nut in irrigated area. However, mycorrhizal fungi increase fruit weight and seed weight and the chemical fertilizer increase root weight and shoot weight in rainfed area. While, the usage of chemical fertilizer at the rate of 75 kg.rai⁻¹ and the inoculation mycorrhizal fungi stimulate shoot weight, fruit weight and seed weight in rainfed area.

Student's signature

Thesis Advisor's signature

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