

Khwanchai Detupakarn 2009: Study on Consumptive Use of Water of Physic Nut (*Jatropha curcas* L.). Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy.
Thesis Advisor: Associate Professor Sombat Chinawong, Ph.D. 127 pages.

The study on consumptive use of water of physic nut has the objectives to determine the consumptive use and time of water application of physic nut. The experiment was dividing into 3 categories. 1. The study on evapotranspiration of physic nut by drip irrigation system. Used the sprit plot in completely randomize design, the main plot was planting method (transplanting from seedling and cutting) and sup plot was the rate of water (1.5, 4.5, 8 and 12 liters/week). The experiment was started form February 2006 until January 2007. 2. Study on evapotranspiration of physic nut and Manila grass by Lysimeter method. The physic nut was grown in 4 lysimeters (percolation type) with the volume of 3.77 m^3 and Manila grass was also growing in 4 lysimeter tank of 3.04 m^3 in size close to physic nut cultivating area. Data collected on drainage water, irrigation water, rainfall and soil moisture content, used the meteorological data to calculating reference evapotranspiration by Penman-Monteith equation and class A pan evaporation. Compared between physic nut evapotranspiration and reference evapotranspiration for calculating crop coefficient. Growth and yield compared among Lysimeter, irrigation field and non-irrigation field. The experiment was started from May 27, 2008 until September 27, 2008, at Agronomy field, Kasetsart University, Kamphaengsaen campus. 3. Effect of water applies on number of inflorescence and growth of physic nut. That consisted of 4 treatments: 1. Irrigation, 2. stop irrigation at initiate flowering, 3. start irrigation at initiate flowering and 4. Throughout growing period no irrigation.

The results of study show that 12 liter/week of application rate of water gave the average highest growth and yield and growth of seedling higher than cutting, but, non significant difference on yield. The consumptive use of water and crop coefficient of physic nut at before flowering stage, flowering stage and fruiting stage were 3.84, 4.21 and 6.00 mm.day^{-1} and 0.96, 1.11 and 1.54 respectively, The reference evapotranspiration measured from Manila grass, Penman-Monteith equation and pan evaporation were 3.90, 3.72 and 3.45 mm.day^{-1} . The data showed that the highest growth, yield and the number of inflorescence were under irrigation throughout growing period and yield reduces 58.96% in no irrigation field and found that growth and inflorescence number reduced when stop irrigation at initiate flowering stage.

Student's signature

Thesis Advisor's signature

____ / ____ / ____