

Anchulee Rattanapinunchai 2011: Effects of Soil Heat Conductance Resulted from Changes of Soil Water Content on the Amount of Water Use by Rubber Trees. Master of Science (Agricultural Research and Development), Major Field: Agricultural Research and Development, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Kumut Sangkhasila, Ph.D. 77 pages.

Rubber trees water uses calculated by Bowen Ratio method, and the relationships between soil water content and water use by rubber trees and soil thermal conductivity were presented. Data were collected from the 10 year old rubber plantation, located in Chachoengsao Rubber Research Center, Sanamchaikhet District, Chachoengsao Province (N13.33 E101.27). Collected data included within and above canopy air temperature and relative humidity, above canopy net radiation, soil temperature and moisture at 0 and 0.10 m data. Data were automatically logged for every 5 minutes continuous starting from 1<sup>st</sup> January 2008 to 31<sup>st</sup> December 2009. Results showed that in 2008, water use by rubber trees were ranging from 28.8 - 128.1 mm month<sup>-1</sup>. Water use in February was highest while that in December was lowest. In 2009, water use by rubber trees were ranging from 24.1 - 87.8 mm month<sup>-1</sup>. Water use in August was highest while that in February was lowest. The 2-year water uses were different because of differences in amount of rainfall and other climatic conditions. In February 2008, amount of rainfall, net radiation and wind speed of the plantation were higher than those of the same month in 2009. The relationships between soil water content and water use by rubber trees and soil thermal conductivity in 2-year were statistically significant. Results of this experiment strongly showed that the water uses by rubber trees were largely dependent on the climate and growth stage of the rubber trees. Soil water content also contribute to water use. Rubber trees mainly absorb water from soil. The higher soil water content, the more water is contained. Rubber trees have sufficient amount water consumed. On contrary, when soil water content is low, amount of soil water is limited for rubber trees to be uptaken even the great evaporative demand exists.

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Thesis Advisor's signature