

**ABSTRACT**

Title : The Response of Mulberry to Amounts of Nitrogen and Water

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Sericulture is a prominent occupation in Thailand. In 1994 more than 300,000 farm families were engaged in this occupation throughout the country. Apparently silk production in Thailand has not yet met demand, leading to import of silk yarn and silk products; in 1995, 418.2 tons were imported amounting to 288.4 million baht.

Success in nurturing silk worm can be reached only where mulberry cultivation is sufficient to feed the silk worm. Optimal season to cultivate silk worm is between late rainy season and dry season. It is, however, noticeable that mulberry cultivation during this period needs water irrigation.

This research aimed to study the response of mulberry to irrigated water and nitrogen at various rates of application and, to study interaction between amounts of water and nitrogen. Trails were done in Nampong soil series (Np), a highly sandy soil mostly found in the Northeast; cultivated mulberry was Nakornratchasima 60 budded on to stalk of Phai variety. There were two trails for two harvesting seasons; the first was during November 1995 - January 1996 with an application of 3 rates of nitrogen namely 3.75, 5.62 and 7.50 kg./Rai/ time together with furrow irrigation of 6, 8, 11 and 15 times with an amount of 28 mm. of water per time; the second trail was during February - May 1996 with an application of 3 rates of nitrogen namely 0.00, 3.75 and 7.50 kg./Rai/time together with furrow irrigation of 4, 6, 8, and 10 times with an amount of 28 mm. of water

per time. The experimental design used was 3 x 4 factorial experiment in randomized complete block designs with 3 replications. The study showed the following :

1. Mulberry is tolerant to drought. It can withstand soil humidity shortage at a level lower than the permanent wilting point of about 10 days in each harvesting season (approximately 70 days) with no effect on yield. During November - December production, the suitable watering period was every 14 days and, during February - April the watering period was every 10 days.

2. Use of American Class A Pan for potential evapotranspiration (ET<sub>o</sub>) more accurate than the use of Penman.

3. In Nampong series, nitrogen fertilizer positively interacted with water in giving mulberry yield. In addition, seasonal timing played an important role in effective use of fertilizer. Recommended rate of nitrogen in cold season (November - January) is 3.75 kg./Rai/time; in hot season (February - April), 7.50 kg./Rai/time

4. Nitrogen fertilization not only helped increase yields but also improved the quality of mulberry leaves i.e. higher nitrogen component. It is believed that the leaves with high nitrogen component give high protein content, too.

5. Application of nitrogen fertilizer and (irrigated) water resulted in rapid growth and better yield i.e. mulberry utilized more nutrients from the soil. It is, therefore, important that fertilizers other than nitrogen be applied as well, namely phosphorous and potassium. Moreover, application of nitrogen after 2 harvesting season reduced soil pH particularly in highly sandy soil like Nampong with low CEC; soil pH test together with lime application should thus be done from time to time to minimize soil acidity, especially in coarse soil texture.