

**Research Title:** Effects of Plant Spacing and Shading on Growth, Yield and Active Ingredients Levels in *Andrographis paniculata*

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## ABSTRACT

Kalmegh (*Andrographis paniculata* (Burm. f.) Nees) is one of the most important medicinal plants in Thailand. However, very few studies have been carried out in development of agro techniques for its commercial cultivation. Thus, the aims of this study were to determine effects of plant spacing and shading on growth and yield in *Andrographis paniculata*. Two experiments were conducted at Faculty of Agricultural Technology, King Mongkut's Institute of Technology Ladkrabang, during November, 2014 to January, 2016.

The first experiment was to investigate the effects of five planting distances on growth and yield of 4 local Kalmegh cultivars. The study was conducted during October, 2015 to January, 2016. A split-plot in randomized complete block design with 3 replications was used. Four local Kalmegh cultivars. (Phitsanulok 5-4, Prachinburi, Ratchaburi and Phichit 4-4) and 5 plant spacing (20x20, 30x30, 40x40, 50x50 and 60x60 cm) were as main plots and sub plots, respectively. The results were shown that stem, leaf, root and total dry weight of Prachinburi were the highest and followed by Ratchaburi, Phichit 4-4 and Phitsanulok 5-4, respectively. The increasing plant spacing increasing stem, leaf, root and total dry weight. Leaf fresh and dry weight yield ( $\text{g m}^{-1}$ ) of narrowest plant spacing (20x20 cm) gave the highest while the widest plant spacing (60x60 cm) gave the lowest. However, there were no interaction between Kalmegh cultivars and plant spacings.

The objective of the second experiment was to determine the effect of shading on the vegetative growth and yield of Kalmegh during November, 2014 to April, 2015. A split-plot in randomized complete block with 3 replications was arranged. Four cultivars (Phitsanulok 5-4, Prachinburi, Ratchaburi and Phichit 4-4) and 5 shading levels (0, 20, 40, 50 and 80 % of shading) were as main plots and sub plots, respectively. The results showed that we were not found interaction between Kalmegh cultivars and shading levels. Stem, leaf and total dry weight of Prachinburi cultivar gave the highest and followed by Ratchaburi, Phichit 4-4 and

Phitsanulok 5-4 cultivars, respectively. Plant height, dry weight of stem, leaf and total dry weight and dry weight yield of kalmegh grown under 20 % shade were the highest whereas plant grown under 80 % shade was the lowest. However, it was concluded that Kalmegh is suitable for cultivation under 20% shade.

Keyword : Shading, Yield, Growth, *Andrographis paniculata*