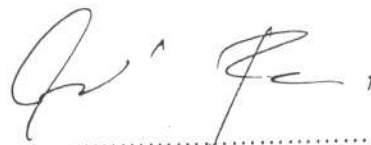


THESIS TITLE EFFECT OF CHEMICAL FERTILIZERS ON GROWTH, FLOWERING
AND FRUIT DEVELOPMENT OF OIL PALM. (*Elaeis guineensis* Jacq.)

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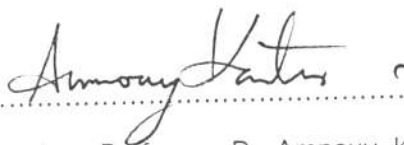
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ABSTRACT

An investigation on the effect of chemical fertilizers on growth, flowering, and fruit development of palm oil crop was carried out for two seasons at the Orchard Farm, Department of Horticulture, Khon Kaen University during June 1995 to March 1997. The plant samples were the 8 years old hybrid oil palm plants derived from Dura x Pisifera i.e. D x P CMR of the Guthrie Company of Malaysia. The plant samples used were 120 plants being grown with the distances used of 6 x 6 meters. The design of the experiment being used was a randomized complete block design with 4 replications. Each replication consisted of 2 plants. The chemical fertilizers being used were ammonium sulphate, Tripple super phosphate and potassium chloride. The levels of chemical fertilizers being used were : nitrogen at the rates of 800 and 1600 g/plant, phosphorous at the rates of 400 and 800 g/plant, potassium at the rates of 1800 and 2400 g/plant. The combination and ratios of N:P:K for treatments being used were 800:400:1800, 800:400:2400, 800:800:1800, 800:800:2400, 1600:400:1800,

1600:400:2400, 1600:800:1800, 1600:800:2400 g/plants. The measurements were recorded on three aspects of soil condition and growth i.e. soil physics and chemistry, soil and leaf nutrition, and also the effects on growth and fruit production due to the application of chemical fertilizers.

The results showed that during the first season there were no statistical differences found in all aspects determined. Similarly, the results of the second season revealed that there were no statistical differences found on soil physics and soil chemistry, however with respect to soil nutrient, the results showed that there were highly significant differences found with those higher rates of chemical fertilizers being used. That is those palm trees treated with high amount of NPK fertilizer levels, (1600:800:2400 and 1600:400:2400 g/plant) contained high amount of nutrients in both soil and leaf tissues. Furthermore, the high rates of chemical fertilizers added to the soil increased leaf growth, chlorophyll a, chlorophyll b, total chlorophyll, thickness of root phloem, sizes of phloem and xylem tissues. With number of male flower sets and fresh weight, the results showed that the application of chemical fertilizers with the ratio of NPK of 1600:800:2400 g/plant and phosphorous rate of 800 g/plant significantly promoted the development of male flower sets and fresh weight of flowers. The chemical fertilizer ratios of 1600:800:2400 and 1600:400:2400 g/plant promoted best the number of fruits/bunch, average weight of fruits, weight of fresh fruit bunch, weight of mesocarp tissue, and percentage of oil content in both mesocarp and endocarp tissues. The ratio of chemical fertilizers of 1600:800:2400 together with phosphorous of 800 g/plant highly promoted the growth of mesocarp and sizes of shells.