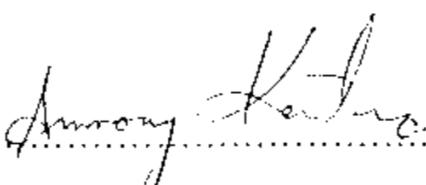


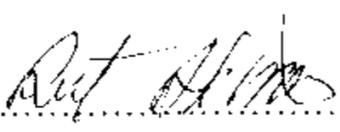
THESIS TITLE : INFLUENCE OF NITROGEN AND PHOSPHORUS AND
HARVEST AGES ON YIELDS AND CURCUMIN CONTENTS
IN TURMERIC (*Curcuma longa* Linn.)

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ABSTRACT

Turmeric, an important medicinal plant is receiving increased attention for its curcumin extract to be exploited for medical uses. Two separated experiments were completed for studies of the effect of nitrogen and phosphorus, and harvest ages on yields and curcumin contents of turmeric rhizomes.

In experiment 1 a pot trial was conducted using five levels of nitrogen; 0, 5, 10, 15 and 20 kg.N/rai and five levels of phosphorus; 0, 5, 10, 15 and 20 kg.P₂O₅/rai to obtain 25 treatment combinations arranged in RCBD with 4 replications. Levels of nitrogen had a highly significant effect ($p < 0.01$) on mother rhizomes weight. Nitrogen at 10 kg.N/rai resulted in the highest fresh weight and dry weight of mother rhizomes, being 19.71 and 4.39 g./plant, respectively. Branches fresh weight was not affected by levels of nitrogen and the weight was in the range of 141.16 and 207.35 g./plant. There was a quadratic increase ($p < 0.05$) in branches dry weight with increasing levels of nitrogen. The highest branches dry weight of 32.01 g./plant occurred at 15 kg.N/rai.

There was no significant effect of phosphorus levels on fresh or dry weight of mother rhizomes and branches.

There was an interaction effect ($p < 0.01$) on curcumin contents of levels of nitrogen and phosphorus. Except for 0 kg. P_2O_5 /rai, at each level of phosphorus, increasing levels of nitrogen lead to higher contents of curcumin, the highest content being 160.49 and 154.69 mg./g. dry weight of mother rhizome and branches, respectively and occurring at the combination of 15 kg. N/rai and 10 kg. P_2O_5 /rai.

Experimental 2 was a field trial using 5 ages of harvest; 4, 6, 8, 10 and 12 months after planting, as treatments arranged in RCBD with 5 replications. Fresh weight of mother rhizomes was maximum, 34.51 g./plant at 4 months of age. The fresh weight declined progressively as plants aged, a rapid decrease occurring at the age of 10 and 12 months. Dry weight of mother rhizomes increased in a quadratic manner ($p < 0.05$) as plants aged attaining the maximum value of 7.44 g./plant at the age of 8 months and after this the dry weight declined slightly.

Fresh weight of branches was maximum, 240.5 g./plant, at the age of 6 months and after this the fresh weight declined rapidly to 122.82 g./plant when plants were 12 months old. There was a quadratic increase ($p < 0.05$) in branch dry weight as plants aged attaining the maximum value of 34.45 g./plant at the age of 8 months. There was a progressive decline in branch dry weight with aging and the lowest dry weight of 22.24 g./plant occurred when plants were 12 months old.

There was a cubic increase ($p < 0.01$) in curcumin content of mother rhizomes and branches of turmeric as plants aged. At the age of 10 months, the highest contents of curcumin in mother rhizomes and branches occurred, being 153.86 and 143 mg./g. dry weight, respectively. There was no further increase in curcumin contents of mother rhizomes or branches at the age of 12 months.