CHAPTER IV

CONCLUSION

The experiments on the effect of phosphorus and potassium on the yield and quality of the volatile oil and the yield of the curcuminoid pigments in the rhizomes of the Curcuma longa Linn showed the following results:

1. The volatile oil content

1.1 The more phosphorus in the soil, the higher was the content of the volatile oil in the rhizome. Optimum phosphorus effect was obtained on addition of 76 ppm in the fertilizer, which caused 40.22% increase in the volatile oil content.

1.2 More potassium in the soil also increased the volatile oil content upto 22.77% on the addition of 565 ppm potassium

2. The quality of the volatile oil

2.1 Phosphorus in the fertilizer more than 14 ppm did not have an advantage on the percentage of total active components, turmerone + ar-turmerone, of the turmeric volatile oil

2.2 The addition of 565 ppm potassium decreased the total active components of the volatile oil.

3. The curcuminoid pigment content

3.1 Potassium had the significant effect on the yield of total pigments. Optimum condition occured on the addition of 365 ppm potassium which increased the pigment yield 31.14%

3.2 Phosphorus only slightly increased the yield of the total pigment (3.86%-5.80%)

3.3 Potassium caused an increase in the content of bis-(p-hydroxycinnamoyl)-methane more than the pigments p-hydroxycinnamoyl-feruloyl methane and curcumin respectively.

It is seen that phosphorus and potassium increased the yield of the volatile oil upto a certain concentration, but both did not have important value to the turmerone content of the oil. Potassium, on the other hand, had significant effect on the pigment content of turmeric rhizomes.

Addition of phosphorus at 90 ppm, and potassium at 800 ppm range as fertilizer was recommended in the cultivation of Curcuma longa Linn to increase both the volatile oil content for better therapeutic value and the pigment content for commercial value.

However, the soil should be rich in nitrogen, as it was important for the production of underground part of all plants.

Since turmeric is an important spice in the world markets, where the consumption was estimated at 700,000 tons per year and the market competition is high, therefore, getting the market share

depends chiefly on the quality and price. Some provinces of Thailand produced turmeric of exceptional qualities, i.e., Songkha-produced the rhizomes very high in volatile oil (21.56%), Ratchaburi-high both in the volatile oil (12.19%) and the pigments (22.90%), and Nakhon Pathom-high in both the volatile oil (17.58%) and the pigment content (19.42%)

Therefore, turmeric production should be promoted in these areas, and agricultural research pertaining cultivation, soil and minerals, and yield/Rai should be performed extensively.