Thesis Title	Influence of Soil Properties on the Curcuminoid Content of *Curcuma longa* L. Cultivated in Chiang Rai, Thailand
Author	Naronk Duangkaew
Degree	Master of Science (Applied Chemistry)
Advisor	Assistant Professor Kanchana Watla-iad, Ph. D.
Co-Advisor	Assistant Professor Tharakorn Maneerat, Ph. D. Assistant Professor Plaipol Dedvisitsakul, Ph. D.

ABSTRACT

Soil properties are major factors that impact Turmeric (*Curcuma longa* L., Zingiberaceae) growth and quality. The Thai Herbal Pharmacopoeia (THP) recommended that dried turmeric should contain not less than 5.0% w/w of total curcuminoids (TC) content. The effect of soil properties on extraction yields and TC contents of turmeric rhizomes was investigated in this study. Twenty-three samples of turmeric rhizome and soils were collected in various cultivation site in Chiang Rai, Thailand. Clustering analysis was used and three group clusters were found; C1, C2, and C3. Two turmeric cultivars; Trang1 (T1) and Trang 84-2 (T84-2) were cultivated in these areas. C1 cultivated both T1 and T84-2 with highest soil pH (4.642±0.802). C2 cultivated exclusively T84-2 with high soil potassium (K) (1821.43 ± 533.63 mg/kg), and C3 cultivated exclusively T1 with high soil calcium (1941.93 ± 686.52 mg/kg). T-test and Principal Component Analysis (PCA) were utilized and found that turmeric qualities between two cultivars was significantly different, with T1 having a higher % yield (p-value = 0.0014), % total curcuminoid (p-value = 0.0131), and % bisdemethoxycurcumin (BDMC) (p-value = 0.001). Pearson correlation analysis was used to find a relationship between soil properties and turmeric qualities. T1 was found having consistent turmeric qualities compared T84-2, which reacted negatively to various soil properties in this study (r<-0.4). This study can be used to understanding the characteristic of turmeric cultivar for managing the extraction

yield of turmeric rhizomes by adjusting the soil properties appropriated for each turmeric cultivar.

Keywords: *Curcuma longa* L., Soil Properties, Total Curcuminoids Content, T-Test, Correlation Coefficient