

Manasanan Kernoon 2008: Effects of Zinc Application on the Response of Corn and Available Zinc Content in Calcareous Soils. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Associate Professor Jongruk Chanchareonsook, D.Agr. 76 pages.

The present work reported the effects of zinc (Zn) application on the response of corn and available Zn content in calcareous soils. Two parts of investigation included the effects of zinc (Zn) application on the response of corn and available Zn content in a calcareous Chai Badan soil series and the effects of zinc (Zn) application on the response of corn and available Zn content in a calcareous Buri Ram soil series. Two pot experiments were carried out using a Completely Randomized design with six treatments and three replicates. The treatments consisted of without and with Zn application at the rate of 2, 4, 6, 8 and 10 mg Zn kg<sup>-1</sup> soil as ZnSO<sub>4</sub>·7H<sub>2</sub>O. Each treatment received a basal application of nitrogen (N) phosphorus (P) and potassium (K) fertilizer at the rate of 200 mg N kg<sup>-1</sup> soil 200 mg P<sub>2</sub>O<sub>5</sub> kg<sup>-1</sup> soil and 150 mg K<sub>2</sub>O kg<sup>-1</sup> soil, respectively.

The results of the first experiment showed that the calcareous Chai Badan soil series was deficient in Zn. Zinc application increased corn yield and Zn uptake significantly comparing with no Zn application. Moreover, the amount of available Zn (DTPA extraction) in the soil increased with the increased rate of Zn application and showed a highly significant correlation with total Zn uptake of corn with the correlation coefficient value (r) of 0.902\*\*. The results of the second experiment showed that the calcareous Buri Ram soil series was deficient in Zn and Zn deficiency was more severe than that in the calcareous Chai Badan soil series. Application of Zn significantly increased growth, dry matter yield and total Zn uptake of corn as compared with no Zn application. An increase in the amount of available Zn (DTPA extraction) in the soil caused by an increase in the rate of Zn application and revealed a highly significant correlation with total Zn uptake of corn with the correlation coefficient value (r) of 0.944\*\*. According to the results of these studies, the recommended rates of Zn application for corn grown in the calcareous Chai Badan and Buri Ram soil series were 2 and 4 mg Zn kg<sup>-1</sup> soil, respectively.

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