Thesis Title   Response of Red Kidney Bean to Chemically Improved Soil in the Highland

Author   Supawadee Sompak

M.S. (Agriculture)   Agronomy

Examining Committee :

Lect. Phrek Gypmantasiri	Chairman
Asst. Prof. Dr. Ampan Bhromsiri	Member
Asst. Prof. Dr. Soonthorn Buranawiriyakul	Member
Assoc. Prof. Suthat Julsrigival	Member

Abstract

Farming area in the highland is characterized by acid soil which limits yield of legume species such as red kidney bean. This study aims to look at responses of growth characters and yield of red kidney bean when soil is subjected to liming and N fertilization. The seed materials used for testing were improved line MKS#8 and local Kae Noi variety.

The factorial experiment was designed as split plot , with variety and liming (0 , 6,250 kg/ha) as main plot, and three level of N (0, 50 , 100 kg N/ha) as sub plot, arranging in a randomized complete block with three replications. The study was conducted in two seasons, early rainly season in May (ERS) and late rainly season in September (LRS) at the Royal Project Station, Ban Kaenoi, Muang Na sub-district, Chiang Dao district, Chiang Mai province. Crop phenology was recoded, and plant samples were taken periodically from vegetative stage till harvest to monitor crop growth.

The results showed that red kidney bean MKS#8 provided plant dry matter yield, crop growth rate, LAI, dry matter yield of different plant parts, and grain yield higer than Kae Noi variety in both seasons. MKS#8 yielded 1,311 and 1,050 kg/ha, while Kae Noi yielded 1,079 and 920 kg/ha.

With liming, red kidney bean produced higher dry matter yield, crop growth rate and grain yield and the application of nitrogen at 100 Kg N/ha provided highest grain yield, averaging 1,339 and 1,149 kg/ha in early and late rainy seasons, respectively.

The BEANGRO model was adopted to analyse the growth and yield of red kidney bean. The genetic coefficients of two varieties were similar. The model was frist calibrated using the ERS data and validated in the LRS. It was found that phenological developement was overestimated but dry matter yield and LAI, the model provided higher estimates but the model provided lower estimate for grain yield.