

PERFORMANCE OF CROPPING SYSTEMS SIMULATION MODEL ON  
MAIZE AND WHEAT CROPPING SYSTEMS IN UASIN GISHU DISTRICT,  
KENYA

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY OF  
THE DEPARTMENT OF ECONOMICS AND AGRICULTURAL RESOURCE  
MANAGEMENT

SCHOOL OF BUSINESS AND ECONOMICS  
MOI UNIVERSITY

NOVEMBER 2010



## ABSTRACT

Simulation models are increasingly being used to simulate and determine growth and other properties of cropping systems because they give reasonable estimates of crop growth and yields and therefore are an important tool to aid farmers and other stakeholders in making decisions and formulating policy. Because simulation models have not been used on large scale cropping systems in Kenya, coupled with frequent fluctuations in crop yields, this study therefore aimed at testing the performance of a cropping systems simulation model on maize and wheat cropping systems in Uasin Gishu district, Kenya. The model was used to analyze maize and wheat cropping systems productivity (yield). Scenario analysis using Monte Carlo simulation was used to examine profitability of maize and wheat under various probable prevailing maize and wheat price scenarios. The results showed that for the cropping system parameters and location used, the model under-estimates the yield of maize by between 6% to 25% and over-estimates the yield of wheat by between 6.5% to 18.7%; and that there are different probable levels of profitability in different cropping systems scenarios ranging from Ksh 35,680 to a loss of Ksh 4,973 per hectare in maize production and from Ksh 73,551 to Ksh 1,887 in wheat production. Though the simulated yields are reasonable estimates the study recommends that further research needs to be carried out on the model used in this study and other models to determine their performance in diverse crop production/farming system conditions.