

**ORGANIC FERTILIZER USAGE FOR SWEET CORN
GROWN ON SPodosOL AND ULTISOL SOILS**

YAHAYA HARUNA RAWAYAU

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**THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENT FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY IN THE SCHOOL OF
FOOD SCIENCE AND TECHNOLOGY**

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DEDICATION

To the deceased, who were unable to see this day, and they could have been the happiest of us all, as our success means a lot to them. Among them is late Alhaji Haruna Rawayau who did what all fathers' do to ensure their children got the best of education available.

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Main Supervisor : Associate Professor Adzemi Mat Arshad, Ph.D.

Co-Supervisor : Wan Zaliha Wan Sembok, Ph.D.

School : Food Science and Technology

Poor soils need to be fertilized for optimum crop production in order to achieve the food security campaigns especially in the developing and under-developed countries. This study was aimed at finding the potential benefits of organic fertilization for sweet corn grown two marginal soils (Rhu Tapai or Spodosol and Rasau or Ultisol) as well as the optimum rate of the organic manure that gives the best crop performance. A 5x2x2 factorial experiment using Randomly Complete Block Design (RCBD) was conducted in four replicates at the shade house to find the best organic manure between chicken manure, cattle manure, horse manure, rice husk biochar and the control treatment (without amendment) with or without Arbuscular Mycorrhiza Fungi (AMF) inoculation under two different soil types; Rasau series soil and Rhu Tapai series soil using Thai super sweet corn as a test

crop. The result showed chicken manure inoculated with AMF under Rasau series soil had significant ($p < 0.05$) growth performance of the test crop compared to other treatments. Based on the results from the glasshouse experiment, the second experiments were conducted in two different locations of Bukit Kor, Terengganu and Tasik Chini, Pahang where both locations have Rasau series soil. The experiment was a 4x2 factorial RCBD replicated four times, with chicken manure rates as the first factor at 4 levels; control 0 t/ha, 25 t/ha, 50 t/ha and 75t/ha, AMF inoculation at two levels (with and without) as the second factor, in a field of 13 m x 24.8 m (322.4 m²) in both locations. Data collected from the two experiments includes; growth parameters (plant height, leaf length, leaf width, leaf number, leaf area, and stem girth), yield parameters (fresh cob length, fresh cob girth, fresh cob weight, biomass dry weight), nutrient concentration (N, P, K, Ca, Mg, Cu, Zn, Fe and Mn) from different plant parts and soil parameters after harvest. In addition pH and organic carbon for the soil were also analysed. The treatment with 50 t/ha significantly ($p < 0.05$) improved the growth performance, yield and nutrient concentration of sweet corn, AMF inoculation only improved the crop performance and yield of the test crop in low chicken manure rates the control treatment (0 t/ha) and 25 t/ha and as well improve the concentration of phosphorus in the plant tissues. Rasau series soil has the potential of producing optimum yield of sweet corn with a single sole application of chicken manure at the rate of 50 t/ha.