SUPPLEMENTARY 2008/2009

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY PAPER

PROGRAMME: BACHELOR OF SCIENCE IN AGRONOMY YEAR THREE
AND BACHELOR OF SCIENCE IN AGRICULTURAL
EDUCATION YEAR THREE

COURSE CODE: CP 302
TITLE OF PAPER: CROP NUTRITION
TIME ALLOWED: TWO AND A HALF (2.5) HOURS

INSTRUCTIONS: ANSWER FOUR QUESTIONS, WITH AT LEAST ONE
QUESTION FROM EACH SECTION

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SECTION 1: SOIL CHEMISTRY

QUESTION 1

(a) Describe the ways in which organic and inorganic colloids obtain negative charges. **(5 marks)**

(b) Discuss the significance of clay minerals when soils are used for crop production and as a medium for the disposal of Municipal waste. **(20 marks)**

[25 MARKS]

QUESTION 2

(a) Discuss the interactions of aluminium and iron oxides with anions in soils. **(17 marks)**

(b) What are the implications of these reactions in the mineral nutrition of plants? **(8 marks)**

[25 MARKS]

QUESTION 3

(a) Discuss climate, parent material and topography as factors which influence the content of organic matter in soils. **(6 marks)**

(b) Discuss the important chemical, physical and biological effects of organic matter which are of significance when soils are used for crop production. **(19 marks)**

[25 MARKS]

SECTION 2: CROP NUTRITION

QUESTION 4

(a) Discuss the methods of fertilizer application you would recommend to farmers in your country for the fertilization of cereal crops. **(13 marks)**

(b) A fertilizer recommendation for the production of maize in the highveld of Swaziland was given as follows:

N - 70 kg ha^{-1}

P - 45 kg ha^{-1}

K - 40 kg ha^{-1}

(i) Calculate the amount of the compound fertilizer 2:3:2 (38) that must be applied to supply the entire N required. **(6 marks)**

(ii) How much P and K would this quantity of fertilizer obtained in (i) above supply? **(3 marks)**

(iii) What is the disadvantage(s) of using compound fertilizers in this recommendation? **(3 marks)**

[25 MARKS]

QUESTION 5

Discuss in detail the role of cattle manure in crop production. **[25 MARKS]**

QUESTION 6

(a) Highlight the pools of potassium in soils and comment on their importance in potassium nutrition of plants. **(9 marks)**

(b) Discuss the factors which influence the availability of potassium to plants in soils. **(16 marks)**

[25 MARKS]