



**2<sup>ND</sup> SEMESTER 2017-2018**

**UNIVERSITY OF SWAZILAND**

**MAIN EXAMINATION PAPER**

**PROGRAMMES:**      **BACHELOR OF SCIENCE IN AGRONOMY YEAR FOUR (4)**  
                             **BACHELOR OF SCIENCE IN AGRONOMY YEAR FOUR (2)**

**COURSE CODE:**      **CPR208 & CP407**

**TITLE OF PAPER:**      **SUGARCANE PRODUCTION**

**TIME ALLOWED:**      **TWO (2) HOURS**

**INSTRUCTIONS:**      **ANSWER QUESTION 1 AND 2 AND ANY OTHER TWO QUESTIONS**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR**

**COURSE CODE: CPR208 & CP407 (M) 2017-2018**

**QUESTION 1 - COMPULSORY**

- a) Discuss sugarcane response to climate change events, sugarcane production, and challenges for sugarcane production brought about by climate change in Swaziland. (10 marks)
- b) Propose strategies for mitigating the negative impacts of climate change and how sugarcane production sustainability and profitability may be improved. (15 marks)

**[25 Marks]**

**QUESTION 2 - COMPULSORY**

- a) Describe the four main areas of focus by pest and disease regulations in Swaziland (10 marks)
- b) By means of a diagram illustrate the structure of the seed cane scheme followed by the Swaziland sugar industry. (5 marks)
- c) Describe the symptoms and methods of control of sugarcane smut (5 marks)
- d) Name the most susceptible variety to smut and explain how the industry has managed this variety to reduce spread of infection. (5 marks)

**[25 Marks]**

**QUESTION 3**

- a) Describe the use of sunnhemp (*Crotalaria juncea* L.) as a green manure crop in the Swaziland sugar industry. (10 marks)
- b) What are the advantages and disadvantages of using sunnhemp compared to other crops that could be used as green manure crop? (15 marks)

**[25 Marks]**

**QUESTION 4**

- a) What do you understand by "soil compaction"? (5 marks)
- b) What are the causes of soil compaction in sugarcane production? (5 marks)
- c) What are the effects of soil compaction on productivity and sustainability in the Swaziland sugarcane cropping system? (5 marks)
- d) How can soil compaction be best managed to minimise its adverse impact in the cropping system? (10 marks).

**[25 Marks]**



**QUESTION 5**

- a) Describe the seed cane production scheme used in the sugar industry. (5 marks)
- b) What are the reasons for using this scheme? (5 marks)
- c) A farmer's association is planning to have a cycle of plant and four ratoon crops, under irrigation and cut at the age of 12 months. Based on the productivity of the farm, 20% of the area under production will be replanted annually. The association has 250 hectares of quota land; a seed cane yield estimate of 90 tons/ha/annum; and a planting rate of 8 tons/ha in commercial fields (approximately 'double stick' at a row spacing of 1.4 m).

Calculate:

- i. The tonnage of seed cane that will be required annually and area of nursery from which this will be cut.
  - ii. What is the total nursery area needed for planting, ploughing-out and fallowing annually? (5 marks)
- d) Assuming that the seed cane in c) above will be required for replanting the farm in August 2020, indicate actions that will have to be taken and timing of these to ensure that good quality and certified seed cane will be available on time. (10 marks)

**[25 Marks]**