

Uganda Martyrs University

Faculty of Agriculture

B. Agriculture II, Semester II Final Assessment: 2015/2016

Course Unit: CRE 2104 Perennial Crops Agronomy

Time: 09:30 am – 12:30 pm

Date: Monday 02nd May 2016

Instructions:

- Answer any Four questions
 - Do not write anything on a question paper
 - Time: Three hours
-

- 1 a). Discuss in detail five key factors that you would critically assess before you plant any perennial crop in an area. (10 marks)
- b). With the aid of a graph, explain the relationship between temperature and the growth of bananas. What do the following terms mean: (i) "heat index" and (ii) "effective temperatures"? (10 marks)
- c). Apples and their relatives (pears, peaches and cherries), cannot be grown in the tropical lowlands. Explain why this is so. (5 marks)
- 2 a). The table below shows the precipitation and potential evapo-transpiration (Ep) figures in mm for an area.

	J	F	M	A	M	J	J	A	S	O	N	D
RF	30	50	108	160	382	570	177	35	61	207	188	113
Ep	147	153	182	178	164	132	124	107	114	138	152	155

Use the data given to:

- (i) Calculate the water balance for the area bearing in mind that the water reserve in the soil cannot exceed 100 mm in a month and the reserve in January is 58 mm. (10 marks)
- (ii) Point out the numbers of very dry and very wet months in the area and suggest how a farmer in that area could comfortably grow bananas without worrying over the dry seasons. (5 marks)
- b). Explain clearly why it is important to try to understand the water balance rather than the total rainfall of an area before planting any perennial crops in the area. (5 marks)

- c). A rainfall below 100 mm/month is considered low in the tropics. On the other hand, rainfall of more than 300 mm/month is considered not very useful and even harmful. Explain these statements. (5 marks)
3. Six external/ environmental factors are known to influence the growth of plants including perennial crops.
- Name these factors, their sources, i.e. where plants get them from, and indicate which ones can be manipulated by the farmer (management) and those which cannot be manipulated. (9 marks)
 - State the "principle of limiting factors" and explain clearly what it means in real life, i.e. its implication when it comes to crop growth and productivity. (6marks)
 - "Careful examination of soil profiles is the first step towards using soils wisely". Explain what this statement means and state why it is good advice to any farmer who is thinking of planting any perennial crop on his/ her land. (10 marks)
4. A farmer in Nkozi Sub-county has 4 hectares (10 acres) of good farmland which he wants to use to plant a perennial crop that must drive him out of poverty within the next 2-3 years. He is thinking of bananas, cassava, clonal coffee, Arabica coffee, pineapples, apples, mangoes and tea. He is actually getting confused! He comes to you for advice and is willing to pay you two million shillings for the advice you will give him provided it is convincing and workable.

Write a 2-3 page professional advice that you would give to this farmer.
(25 marks)

- 5a). Discuss the ecology and field operations necessary for rapid growth, high yields and good quality of pineapples. (15 marks)
- b). "Pineapple is considered a true xerophytic crop. It has many adaptations to drought." List and discuss in detail five (5) of these many adaptations. (10 marks)
6. Mulching is one of the key agronomic practices recommended for most perennial crops.
- For pineapples, discuss how mulching is done, the benefits derived from it and the problems associated with the practice. (10 marks)
 - For bananas in Uganda, discuss how mulching is mainly done and the problems associated with it. (10 marks)

- c). Why is it not advisable to regularly weed perennial crops with a hoe or machinery and what roles do cover crops play in perennial crops fields?
(5 marks)

7 a). Draw a map of Uganda and on it indicate the main areas where tea and Arabica coffee are grown. What are the main ecological characteristics of these areas? Explain the reasons why tea is not grown in the Mt. Elgon highlands but Arabica coffee is and why Arabica coffee is not grown in the northern shores of Lake Victoria and yet tea is. (15 marks)

- b). Discuss the advantages and limitations of cassava as an important subsistence perennial crop. (10 marks)

8. The main reason most farmers grow perennial crops is because they want to earn some income from these enterprises. Consequently, two neighbouring farmers in Ntungamo district decided to grow pineapples and bananas for commercial purposes. One planted pineapples on 1.0 ha. of his land while the other planted bananas also on 1.0 ha.

- a). What records did these two farmers need to keep in order for them to be able to determine whether their enterprises were profitable at the end of two years? (5 marks)
- b). If the pineapple farmer used a double row spacing of 30 X 60 X 90 while the banana farmer used a 3m by 3m spacing, calculate the number of suckers each one used to plant 1.0 ha. and how much money did each farmer spend on buying suckers if each pineapple sucker was costing Shs. 250/= and each banana sucker was costing Shs. 1000/= (10 marks)
- c). Calculate the total income received by each farmer at the end of two years if each pineapple was on average sold at Shs. 1500/= and each banana bunch at Shs. 10,000/=. What recommendation can you make for other farmers in Uganda as a result of this "unintended experiment"? (10 marks)