



**"Investing in Africa's Future"**

**COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES**

**NACP 213: PRINCIPLES OF CROP PRODUCTION**

**END OF SECOND SEMESTER FINAL EXAMINATIONS**

**APRIL 2023**

**LECTURER: MR. L. KIES**

**DURATION: 3 HOURS**

**Answer ALL questions. For questions requiring calculations, show your work and identify your answers clearly.**

- 1 a. Discuss the advantages and disadvantages of using seedbeds and later transplanting as compared to direct seeding. (4 marks)
- b. Explain briefly the meaning of the following terms:  
 i) catch crop  
 ii) pulse crop (2 marks)
- c. A farmer named Sueli wishes to apply 150 kg/Ha of nitrogen to a crop. She first applied 200 kg/Ha of the fertilizer Double-D (14:28:14).  
 How many kg/Ha of urea (46% N) should she apply? Show your work. (2 marks)

- 2 For the following crops, give the information requested: (6 marks)

a.	barley	Main use in Zimbabwe
b.	rice	Protein content, %
c.	cowpeas	Rainfall or irrigation needed, mm
d.	sweet potato	Typical yields in Zimbabwe, tonnes/Ha
e.	maize	High yields in Zimbabwe, tonnes/Ha
f.	cassava	Method of propagation

- 3 A farmer wishes to plant maize with a final population of 45,000 per hectare using 90 cm rows. The seed is expected to have 91% germination, and he expects 6% field losses.

- a. What should be the final average spacing within the row? (2 marks)
- b. When setting the planter, what population should he use? (2 marks)
- c. Discuss the principle of sowing seeds at the correct *spacing*, giving examples. (5 marks)

- 4a. Explain why cereals normally have higher total yields than legumes when both are given adequate water and fertiliser. (1 mark)
- b. Use typical yields of soyabean to show how protein yields per Ha can be calculated. (2 marks)
- c. Compare tropical legumes vs tropical grains regarding the production of **protein** per Ha. (1 mark)

- 5 Integrated Pest Management has four major components. One is Chemical. Discuss TWO of the other three components, giving at least two examples of each. (8 marks)

6 Simflossa had a plot of maize that was 6 m x 6 m. She harvested 190 cobs of maize which weighed a total of 48 kg. She then shelled a sample of 10 cobs, and found the grain weighed 1.9 kg while the cobs weighed 0.2 kg.

What was the plot's yield of grain in tonnes per hectare? (3 marks)

Compare the yield of Simflossa's plot with typical yields of small-scale farmers and successful commercial farmers in Zimbabwe. (2 marks)

7 Copy and fill in the table for the following crop plants.

(9 marks)

Common name	Latin name	Most important part of the plant for marketing	Botanical family
	<i>Vigna subterranea</i>		
	<i>Daucus carota</i>		
	<i>Chloris gayana</i>		

8 The table below shows characteristics of four maize varieties named using the Seedco system for maize.

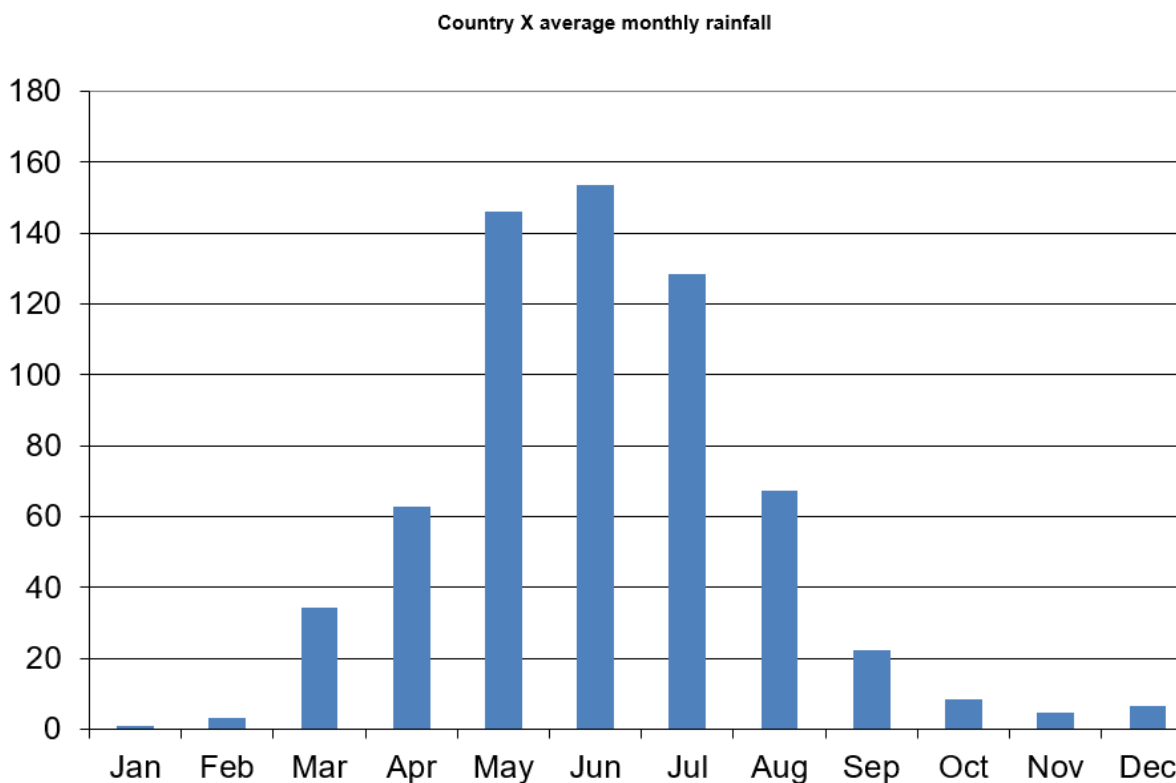
Variety name	WW447	XX523	YY607	ZZ759
Grey leaf spot (GLS) tolerance	7	1	1	8
Maize streak virus (MSV) tolerance	3	2	2	1
Days to maturity	127	132	148	158
Yield potential, tonnes/Ha	1-4	3-6	6-12	8-13
Interpretation of scores: 1 = Very good (tolerant), 9 = Poor (susceptible)				

Name the variety (choosing from one of the four above) which will probably yield the best under the following conditions: . (2 marks)

Variety	Rainfall, mm	Irrigation available?	GLS present?	MSV present?
<b>a.</b>	450	No	No	Yes
<b>b.</b>	620	No	Yes	No

c. Name the variety that probably requires the most Heat Units to achieve maximum yields.

(1 mark)



A farmer named Chancey has moved to new country X. The above graph shows the average monthly rainfall. The farm has the same latitude, and distance from the sea as Mutare (elevation 1100 m), but is at 1500m.

No irrigation is possible.

- a. Based on the information given, *discuss* briefly the suitability (regarding temperature and rainfall) of the following crops:
  - i. wheat
  - ii. bambara nuts

(4 marks)
- b. Discuss the suitability of paddy rice at this place if the altitude is 2000 m. (2 marks)
- c. Sugar beans were sown on 1 February at Harare (elevation 1300m) and Juliusdale (elevation 2000 m).  
Use your understanding of Growing Degree Days and climate to explain which crop will mature first and why. (2 marks)

End of Examination Paper