



"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. When establishing a crop, discuss the advantages and disadvantages of using vegetative propagation instead of seeds, giving examples. (4 marks)

b. Explain briefly the meaning of the following terms:

i) trap crop

ii) pulse crop

(2 marks)

c. A farmer named Marvelous wishes to apply 140 kg/Ha of nitrogen to a crop. She first applied 250 kg/Ha of the fertilizer Compound D (7:14:7).

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.	cassava	Protein content, %
c.	rice	Rainfall or irrigation needed, mm
d.	green beans	A crop that should follow it in a recommended garden rotation
e.	potatoes	High yields in Zimbabwe, tonnes/Ha
f.	sweet potatoes	Method of propagation

3 Chancey wishes to plant maize with a final population of 55,000 per hectare using 90 cm rows. The seed is expected to have 94% germination, and he expects 5% 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 *depth*, 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)

d. Compare the TOTAL yields of non-cereal energy crops with those of cereals, giving examples.

2 marks)

5 a. Use the principles involved in determining the Centers of Origins of crops to explain how scientists might prove that Rhodes grass is native to Zimbabwe.

(5 marks)

b. What is the value to crop scientists of knowing the geographical origin of a crop?

(1 marks)

c. Give two reasons why millet is a dominant crop in some parts of the Sahel (south of the Sahara Desert)?

(2 marks)

6 Janet had a plot of maize that was 4 m x 6 m. She harvested 120 cobs of maize which weighed a total of 36 kg. She then shelled a sample of 10 cobs, and found the grain weighed 2.4 kg while the cobs weighed 0.5 kg.

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

Compare the yield of Janet'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>Glycine max</i>		
	<i>Lycopersicon esculentum</i>		
	<i>Phaseolus vulgaris</i>		

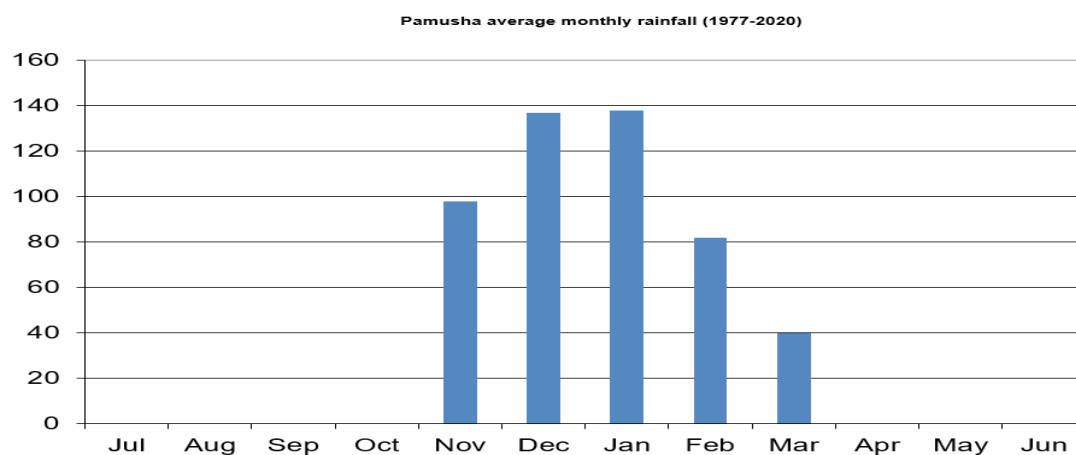
8 The table below shows characteristics of four maize varieties named using the Seedco system for maize.

Variety name	WW447	XX523	YY607	ZZ759
Grey leaf spot (GLS) tolerance	3	2	2	1
Maize streak virus (MSV) tolerance	7	1	1	8
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?
a.	450	No	No	Yes
b.	620	No	Yes	No

c. Name the variety that probably requires the *least* Heat Units to achieve maximum yields. (1 mark)



A farmer named Brandon has moved to new place called Pamusha. 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 900m.

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)

End of Examination Paper