



AFRICA
UNIVERSITY
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"Investing in Africa's Future"

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

NACP 213: PRINCIPLES OF CROP PRODUCTION

END OF SECOND SEMESTER FINAL EXAMINATIONS

APRIL 2022

LECTURER: MR LARRY KIES

DURATION: 3 HOURS

INSTRUCTIONS

Do not write your name on the answer sheet

Use Answer Sheets Provided

Begin your answer for Each Question on a New Page

Credit is Given for Neat Presentation

NACP213

Principles of Crop Production

Answer ALL questions.

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

1 Essay. Explain Vavilov's theory of Centers of Diversity, why it is important to modern-day crop scientists, and give at least one example. Use complete sentences and good English.

(5 marks)

2 A farmer named Rosie wishes to apply 140 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)

3 Give one example each of an important crop plant in the following families that have the stated characteristics.

(8 marks)

| Family | characteristic | Crop plant |
|----------------|--|------------|
| Legume | Forage crop | |
| Convolvulaceae | Warm-season energy crop | |
| Umbelliferae | Petiole is marketed | |
| Chenopodiaceae | Root crop | |
| Brassicacea | Leaf crop | |
| Cucurbit | Fruit | |
| Graminae | Frequently transplanted | |
| Solanaceae | Both mature and immature fruits are marketed | |
| Legume | pulse | |

4 A farmer named Farai planted a field of maize with rows spaced 75 cm apart. His target population was 55,000 plants per hectare.

After the crop emerged, Jack measured 12 meters of three separate rows, and then counted the number of plants in each with the results:

Row1- 75 plants

Row2- 86 plants

Row3- 84 plants

a. What can you tell him about how his actual population compared to his target population?

Show your work.

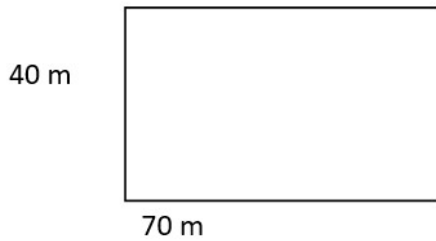
(4 marks)

b. What advice should you give him about correcting the population if it is not correct? (2 marks)

c. Use good, clear English to discuss the principle of sowing seeds at the correct *depth*, giving examples.

(5 marks)

- 5 Amos has a field with the following dimensions (he measured with a tape measure so didn't need to estimate using paces.). What will be a reasonable yield of maize, in kg? (4 marks)



- 6a. Explain why cereals normally have higher **total yields** than legumes when both are given adequate water and fertiliser. (1 mark)
- b. Compare tropical legumes vs tropical grains regarding the production of **protein** per Ha.(1 mark)

- 7 Choose one crop **other than** maize and give the following for it: (8 marks)
- a. Botanical family and Latin name
 - b. climate (rainfall and temperature) requirements
 - c. uses in Zimbabwe
 - d. typical yields and high yields in Zimbabwe (in tonnes/Ha)

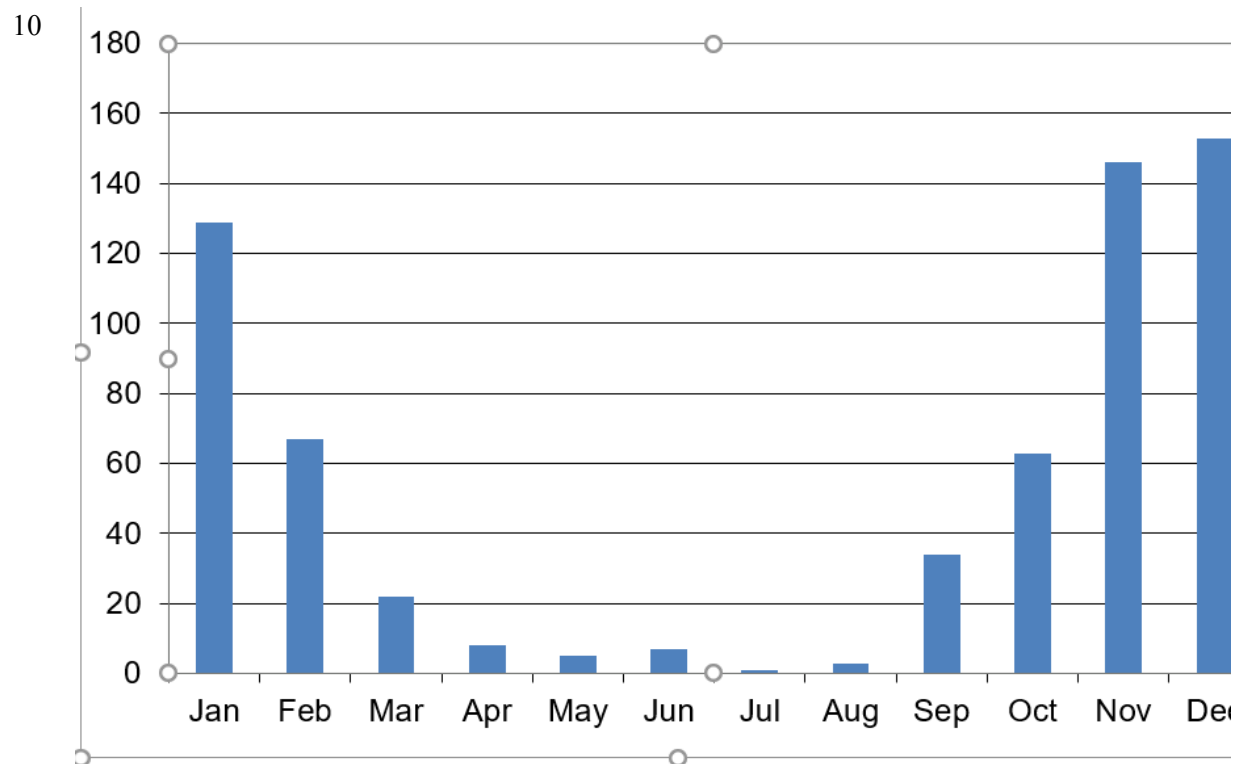
- 8 Delphine had a plot of maize that was 8 m x 3.6 m. The plot had 109 plants. She harvested 102 cobs of maize which weighed a total of 30.3 kg. She then shelled a sample of 12 cobs, and found the grain weighed 3.2 kg while the cobs weighed 0.8 kg.

- a. What was the plot's yield of grain in tonne per hectare? (3 marks)
- b. Compare the yield of Delphine's plot with typical yields of small-scale farmers and successful commercial farmers in Zimbabwe. (2 marks)

9 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>Arachis hypogaeae</i> | | |
| | <i>Glycine max</i> | | |
| | <i>Capsicum frutescens</i> | | |



A farmer named Janet has moved to a new country. 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 **800 m**.

No irrigation is possible.

a. Based on the information given, *discuss* briefly the suitability of the following crops:

- sorghum
- groundnuts

(4 marks)

b. Which is probably the best month for planting maize at this site? Explain.

(2 marks)

End of Examination Paper