

Candidates are admitted to the examination room ten minutes before the start of the examination. On admission to the examination room, you are permitted to acquaint yourself with the instructions below and to read the question paper.

Do not write anything until the invigilator informs you that you may start the examination. You will be given five minutes at the end of the examination to complete the front of any answer books used.

April 2009

Answer Book

**Any bilingual English language dictionary permitted
Calculators and programmable calculators are permitted**

THE UNIVERSITY OF READING

**MSc/Diploma
Applied Meteorology and other MSc / Diploma Programmes**

Paper MTMA40

Vegetation, Agriculture and the Atmosphere

Two hours

Answer any TWO questions

The marks for the individual components of each question are given in [] brackets. The total mark for the paper is 100.

1. Describe why the analysis of year to year variability of weather is important in planning agricultural systems. Describe, giving two examples, the use of cumulative probability distributions in such analyses. Discuss the possible contribution of crop simulation models in such planning studies.

[50 marks]

2. Outline the current FAO methods for estimating crop water requirements of an annual crop based on the Penman-Monteith equation. State what crop and climatic data are required in this process and discuss factors that must be considered in deriving values of crop coefficients. Discuss the relationships between crop factors and aerodynamic and surface resistances.

Explain the meaning of the terms ‘total available water’ and ‘readily available water’ as used by FAO. Illustrate your answer by calculating the values of these variables for a specific crop growing in a specific soil type.

[50 marks]

3.

- (a) Describe the effects of a shelterbelt on the microclimate of the surrounding area and how the characteristics of a shelterbelt affect these changes. Discuss the applications of shelterbelts in both temperate and tropical regions.

[25 marks]

- (b) Describe the effects of weather on the spread of foot and mouth disease in animals.

[25 marks]

(End of Question Paper)