

**The University of Melbourne**

**Semester 2, 2004 Assessment**

**School of Agriculture and Food Systems  
208208 - Crop Production  
Pass and Honours**

**Reading Time 15 minutes**

**Writing Time 3 hours**

**This paper has three pages**

**Authorised Materials:**

Calculators may be used.

No other materials are authorised to be used in this examination.

**Instructions to Invigilators:**

Students will require three script books each to answer section A, B and C of this examination paper.

Students may remove the examination paper from the examination room.

**Instructions to Students:**

This examination is divided into three sections, answer each section in a separate examination booklet

Students are required to answer **six (6)** questions on this examination, at least one from each section.

All questions are of equal value.

**Paper to be held by Baillieu Library:**

This paper may be held with the Baillieu Library.

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## **SECTION A**

### **Question 1**

Define grain quality for a cereal (wheat or barley) and seed quality for rapeseed (*Brassica napus*). In the case of rapeseed, differentiate between canola and specialty oil types. Explain how cultivar choice, agronomic management and climate interact to determine grain quality of a cereal crop.

(20 marks)

### **Question 2**

Explain (i) why matching supply and demand of nitrogen is particularly challenging in rainfed agriculture and (ii) the importance of timing and method of nitrogen application for grain yield and quality of a cereal crop.

(20 marks)

## **SECTION B**

### **Question 3**

Diseases are major impediments to crop production. (a) Explain the main effects of diseases on crop production, giving examples of diseases for each (b) AND describe the major methods of management. In your answer show a clear differentiation between the main types plant resistance.

(20 marks)

### **Question 4**

Explain the dynamics of the seedbank and how seeds can determine their position in the soil and time of year.

(20 marks)

### **Question 5**

Describe an integrated non-chemical weed management program, indicating management strategies for all stages of the crops growth cycle. **ALSO** discuss the reasons why these strategies are useful in managing weeds

(20 marks)

### **Question 6**

Resistance to agricultural chemicals (insecticides, fungicides, herbicides, antibiotics) has developed over the past 50 years. Explain the main causes and mechanisms of resistance development, describing the differences in these between the major kingdom groups – eukaryotes, fungi, plants and animals.

(20 marks)

## **SECTION C**

### **Question 7**

The late break in 2004 has caused many farmers to revise crop selection. Discuss what changes farmers have made and why they have made these changes. Also discuss what considerations growers have to make to future crop selections when these short-term alternatives have been used.

(20 marks)

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**Question 8**

Explain the importance of matching shoot number to environment for successful grain production. Your answer should discuss the implications of high or low shoot numbers and how growers can manage this benchmark.

(20 marks)

**Question 9**

Temperature is an important determinant of crop development. Discuss the relationship between crop development and temperature. Your answer should also discuss how growers could use this relationship in crop management.

(20 marks)

**Question 10**

Compare and contrast the cropping systems in the Wimmera, the Mallee and the Victorian High rainfall zone.

(20 marks)

**Question 11**

Water is a critical resource for crop production in most of southeastern Australia. Discuss the basis for the "French and Schulz model" relating yield to water use where:

Yield (kg/ha) = WUE \* (Seasonal Water Supply - Soil Evaporation).

In addition to the discussion of this model, identify the limitations that such models present and the ways the models can be used by growers.

(20 marks)

**"End of Examination"**