THE UNIVERSITY OF MELBOURNE

Semester 1, 2005 Assessment

208-243 ECOLOGY AND MANAGEMENT OF GRAZING SYSTEMS

Time allowed: Three hours

This paper has 2 pages

ANSWER FIVE (5) QUESTIONS. ALL QUESTIONS ARE OF EQUAL VALUE

1. Almost all of the so-called 'improved' pasture species used in southern Australia have been introduced from overseas. Following from this observation, answer **ALL** three (3) parts of the questions below:
   A. From which regions of the world have these species originated? Use examples to match species to regions.
   B. Why do southern Australian grazing systems rely heavily on plants that have evolved in overseas environments rather than those that have evolved in the Australian environment?
   C. What are some of the implications of this reliance on introduced species for pasture and grazing management practices?

2. Describe the key growth processes and structural features of perennial grass species that determine the growth and persistence of these species in grazed pastures. Use an example to show how this information can be applied in practical grazing management recommendations that improve the yield and/or persistence of pastures.

3. Answer **EITHER** part A **OR** part B

   A. Define what is meant by the term 'feeding value' in relation to the quality of pasture for animal production. What factors influence the feeding value of a pasture, and what management practices can be used to manipulate feeding value?

OR

   B. Approximately how much pasture dry matter would you expect a) a mature ewe of 55 kg liveweight and b) a dairy cow of 600 kg liveweight at peak lactation to consume per day? What factors will affect the amount of pasture *actually* consumed by these animals on a daily basis? Consider both pasture management and animal factors in your answer.

4. The practice of grazing ryegrass-based pastures at the '3-leaf' stage to optimize production is becoming commonplace in the dairy industry and, to a lesser extent, the sheep and beef industries. With reference to the dynamics of pasture regrowth, explain the theoretical basis for this grazing management guideline. Why '3-leaf' and not '2-leaf' or '4-leaf'? What situations might cause the 3-leaf rule to fail (i.e. lead to sub-optimal production), and what adjustments should be made in these situations?

5. Answer **EITHER** part A **OR** part B

   A. Soil testing is a tool that farmers and their advisers can use to assist in pasture improvement programs. However, survey information suggests that less than 50% of extensive livestock producers in southern Australia use soil testing on a regular basis. In your capacity as an agricultural adviser, you are asked to address a group of farmers in a district of western Victoria where the rate of uptake of soil testing on farms is very low. In your talk to the group, what would you nominate as the three main benefits of soil testing, and why? You are aware that the audience members are interested in making more profit from their farms, therefore it would be smart to include some comment about the potential financial advantages of soil testing in your address.

   OR

   B. Sheep and beef farmers are increasingly using estimates of the botanical composition of their pastures to help make decisions about pasture and grazing management. Describe some of the simple tools or techniques that can be used to assess botanical composition. Use an example to show how this information, either alone or along with other information, can be used to help manage animal production from pasture.

6. What are the main objectives and elements of 'grazing management'? How does each of the grazing management elements that you have identified contribute to the objectives. Which of the elements has the greatest impact on each objective?

7. In the past 2 decades, researchers have uncovered a three-way interaction between the perennial ryegrass plant, endophytic fungi ('ryegrass endophyte') associated with the plant, and animal health. What is the ryegrass endophyte, and what effects does it have on the growth of the plant and on animals grazing ryegrass pastures infected with the endophyte? How can some of the negative effects of the endophyte on animal health be overcome?

END OF EXAMINATION