

HCS612 - Mid-term exam

Name.....

30 October 2003

Kottman 116, 8:00-9:48 am

- Complete 10 of the following questions (clearly show which 2 questions you do not answer)
- Each question is worth 10 points.
- Closed book exam, 1 page of notes is allowed

Question 1) Knowledge of animal intake is important in grassland management. What are 2 reasons why such information is important (4)

a)

b)

Describe 4 methods for measuring animal intake from pasture (1-2 sentences each) (6)

c)

d)

e)

f)

Question 3) Rotational grazing has a different pattern of vegetation removal than continuous grazing, with implications for crop yield and quality. In addition to these direct effects on the patterns of herbage removal, rotational grazing has numerous other benefits that ‘indirectly’ benefit forage production and grazing system performance. Describe 5 such ‘indirect’ benefits of rotational grazing (1-2 sentences for each).

a)

b)

c)

d)

e)

Question 4) Multi-choice. Circle the only correct answer

- 4.1 A convenient calibration for converting pasture height to mass is:
- 25 lb dry matter/ac per inch
 - 2500 lb dry matter/ac per inch
 - 25 kg dry matter/ha per inch
 - 150 kg dry matter/ha per cm
- 4.2 The Latin name for white clover is:
- Trifolium repens*
 - Trifolium pratense*
 - Trifolium ambiguum*
 - Trifolium subterraneum*
- 4.3 ADF is the abbreviation for:
- all digested fiber
 - acid detergent fiber
 - acid detergent forage
 - abomasum-digested fiber
- 4.4 The difference between the ADF and NDF value of a forage is mainly due to:
- lignin
 - protein
 - water soluble carbohydrates
 - hemicellulose
- 4.5 Non-toxic (novel) endophytes are specific races of an endophyte species that:
- are not transmitted by seed
 - do not produce ergovaline
 - increase drought tolerance
 - can infect all grass species
- 4.6 A 100 acre farm with 50 paddocks, 80 cows and a grazing rotation of 25 days will have:
- a stocking density of 20 cows/ac and a stocking rate of 20 cows/ac
 - a stocking density of 0.8 cows/ac and a stocking rate of 0.8 cows/ac
 - a stocking density of 20 cows/ac and a stocking rate of 0.8 cows/ac
 - a stocking density of 0.8 cows/ac and a stocking rate of 20 cows/ac
- 4.7 NDF is always
- greater than ADF
 - less than ADF
 - approximately equal to ADF
 - unrelated to ADF
- 4.8 Bypass protein is the protein which:
- is bypassed during grazing
 - is digested during rumination
 - is not digested, and passes through the animal
 - is protected from digestion in the rumen and is digested in the intestine
- 4.9 The typical response of forage to applied nitrogen is:
- 1 lb DM/lb N
 - 5 lb DM/lb N
 - 20 lb DM/lb N
 - 50 lb DM/lb N
- 4.10 The $-3/2$ tiller rule in grasslands relates to the slope of the relationship between:
- tiller size and tiller density
 - log tiller size and tiller density
 - log tiller size and log tiller density
 - tiller size and log tiller density

Question 5) Legumes are a critical component of the nitrogen cycle in grasslands, since they fix N_2 from the atmosphere and incorporate it into plant protein. Give 5 pathways by which legume-N eventually becomes available to grasses.

a)

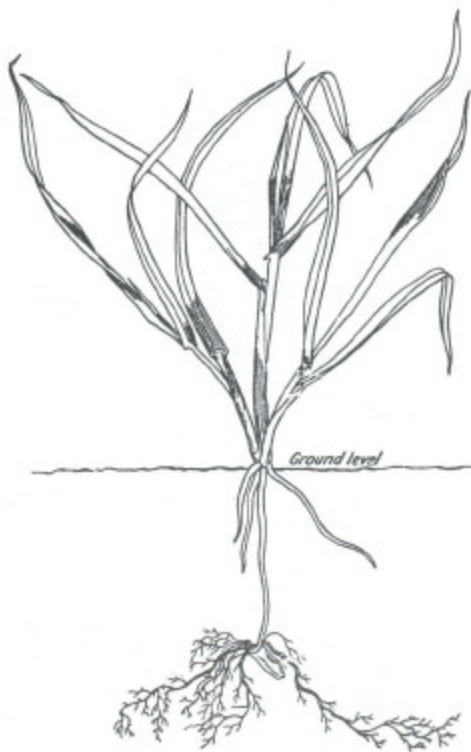
b)

c)

d)

e)

Question 6) Forage plants have different patterns of growth resulting from differences in the location of their meristematic points. Show the location of the meristems on the following 2 diagrams.



Question 7) Pasture growth is always greatest in spring. Give 4 environmental/physiological factors that contribute to this peak in forage growth (6)

a)

b)

c)

d)

What are 2 problems that might result from the failure to adequately control spring pasture growth (i.e. if the pasture is allowed to accumulate excess mass) (4)

e)

f)

Question 8) Give 5 ways that forage affects animal intake, and briefly (1-2 sentences) explain the nature of this effect.

a)

b)

c)

d)

e)

Question 9) a) what is endophyte?

b) Give 2 reasons why livestock on endophyte infected grassland have lower production?

c) What are 2 species of plant, which do not contain endophyte?

d) How do endophytes in tall fescue differ from endophytes in ryegrass?

e) What are 2 management recommendations you would give a farmer who wanted to reduce the amount of endophyte on his farm?

i)

ii)

Question 10) Give 5 ways in which forage differ from other crops in their response to drought.

a)

b)

c)

d)

e)

Question 11) Describe 5 methods used to measure pasture mass or pasture growth rate. Briefly describe an advantage and disadvantage of each method

a)

b)

c)

d)

e)

Question 12) The balance between grasses and legumes is one of the fundamental relationships in grasslands.

a) Give 3 commonly used grass-legume mixtures throughout the world?

b) Give 4 factors contributing to the complexity of the grass-legume balance – and briefly (1 sentence) to describe the nature of each of these factors

i)

ii)

iii)

iv)