

Final Exam HCS412 – Forages
10:00 am Friday 6 June 2002, K334
9:30 am Wednesday 12 June 2002, K334

Name:.....

Instructions:

Complete Question 1 (required) and 12 other questions from the 15 options.
All questions carry equal credit (10 points per question), except Question 1 - 5 points
The exam has a total of 125 points
Show working and units in all calculations
Time allowed: 1 hr 48 minutes

Question 1 (Required)

For one forage species you are familiar with, state:

Common name (0)

a) Latin name (1)

b) Name of one variety (1)

Write one key point on each of the following:

c) The most distinguishing feature to identify the species (1)
.....
.....

d) The main advantage/benefit of this species (1)
.....
.....

e) The biggest disadvantage/limitation with this species (1)
.....
.....

Question 2

Compared to other crops, forages have attributes that make them unique in their interaction with drought. Name 4 such attributes and a sentence for each to describe its significance to forage production:

a)

b)

c)

d)

Question 3

Complete the following Table by giving the common name for one forage species in each row; and one important advantage and one important disadvantage for that species

	Advantage	Disadvantage
C4 forage grass		
C3 forage grass		
Forage legume		
Forage Forb (non-grass, non-legume)		

Question 4

Complete the sentence with the most appropriate keyword from the list provided

- a) Measurements of forage quality include ADF and NDF values. The difference between ADF and NDF is mainly due to
- b) Physiological responses of forages to drought can include leaf rolling, stomatal closure, changed cell wall elasticity and
- c) For a single grazing, the ratio (or percentage) of consumed forage mass : initial forage mass is called the
- d) The concentration of silage is typically in the range 4-5%
- e) Warm season grasses such as sorghum-sudan grass can accumulate toxic levels of in the fresh regrowth after a drought.

(protein, hemicellulose, energy, rotation length, utilization, palatability, lactic acid, nitrate, prussic acid, dry matter, osmotic adjustment)

Question 5

A farmer from south-east Ohio has a 5 acre field, currently in tall fescue, that he wants to plant in a better pasture species (a soil test found 10 ppm phosphate, pH=5.9 , and the pasture is intended for cow-calf grazing)

- a) What treatment(s) do you recommend for the field prior to planting?

- b) What forage(s) do you recommend should be planted (and why)?

- c) By what method and at what time of the year should the field be planted (and why)?

- d) How should the field be managed in the first year after planting?

- e) Is there any other information you suggest the farmer consider prior to starting this operation?

Question 6

Silage and hay are 2 different methods to preserve forage for later use:

- a) What is/are the key process(es) by which preservation is achieved in silage?

- b) What is/are the key process(es) by which preservation is achieved in hay?

- c) What are 3 management methods that can improve rate of preservation (and hence quality) of silage.
 - i).....
 - ii).....
 - iii).....

- d) What are 3 management methods that can improve rate of preservation (and quality) of hay.
 - i).....
 - ii).....
 - iii).....

Question 8 – multi-choice. Circle the only correct answer

12.1 Bermuda grass pasture is established by planting sprigs (stolons) because:

- a) This is cheaper than other methods
- b) This is the only way to maintain the genetic integrity of the pasture
- c) Some Bermuda grass varieties do not produce seed
- d) This method is the most reliable

12.2 The Latin name for white clover is:

- a) *Trifolium hybridum*
- b) *Trifolium repens*
- c) *Trifolium pratense*
- d) none of the above

12.3 The typical pH of silage is

- a) 2-3
- b) 3-4
- c) 4-5
- d) 5-6

12.4 ADF is short for:

- a) acid detergent forage
- b) acid detergent fiber
- c) all digested fiber
- d) all dietary fiber

12.5 Bypass protein is the protein which:

- a) is bypassed during grazing
- b) is digested during rumination
- c) is not digested, and passes through the animal
- d) is protected from digestion in the rumen and is digested in the intestine

12.6 Frost seeding is best done in:

- a) December
- b) February
- c) April
- d) June

12.7 The toxicity of tall fescue endophyte is due to:

- a) ergovaline
- b) dicoumarol
- c) Mg deficiency
- d) Low protein

12.8 The livestock bleeding syndrome associated with feeding sweet clover hay, only occurs for hay that:

- a) is harvested too soon after a drought
- b) is harvested on crops that are too mature
- c) has been spoiled by heating (baling too wet)
- d) is harvested in fall

12.9 The range of dry matter percentage that there is no suitable method for forage preservation is:

- a) <50%
- b) >75%
- c) 50-60%
- d) 60-75%

12.10 Perennial ryegrass can be differentiated from tall fescue by:

- a) an especially shiny abaxial leaf surface in ryegrass
- b) in tall fescue the emerging leaf blades are rolled rather than flattened
- c) tall fescue leaves have particularly sharp edges
- d) all of the above

Question 9

a) Briefly describe an advantage and disadvantage for each of the following methods for establishing forage species

i) Full cultivation

ii) no-till drilling

iii) Frost seeding

b) What is the key factor for the success of each of these methods for forage establishment:

i) Full cultivation

ii) no-till drilling

iii) Frost seeding

Question 12

Forage species are most often recognized for their positive attributes. However, on the basis of the definition that a weed is any species growing out of place, most forage species also have the potential to be designated weeds in some circumstance. For the following table, give an example of one weed species in each of the categories, describe in what way it constitutes a weed, and also describe one positive attribute of that species.

Category	Why is this species a weed?	List one positive attribute of the species
Annual species		
Biennial species		
Perennial species		
Creeping species		
Rhizomatous species		
Invasive/dominant		

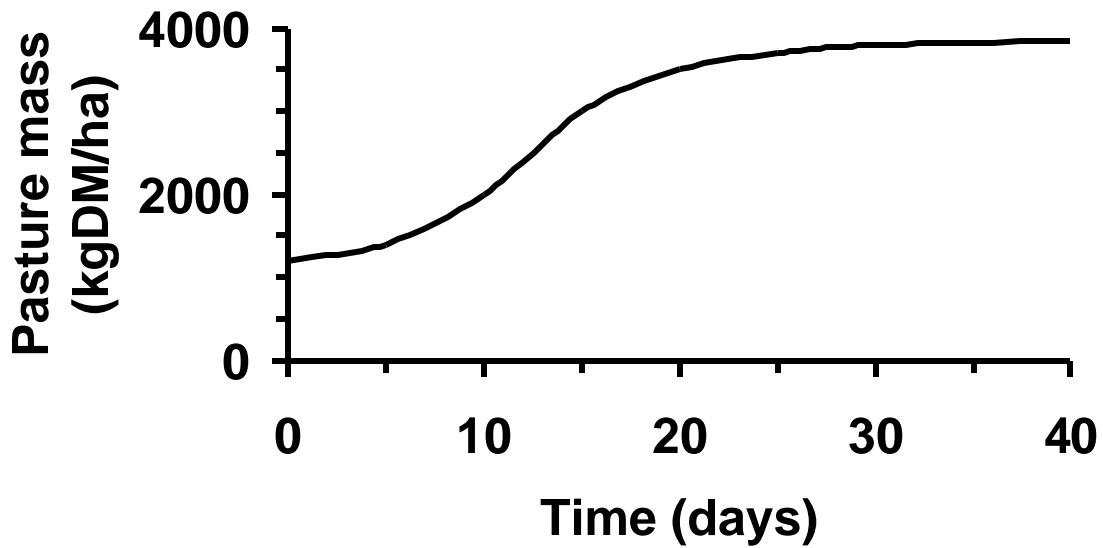
Question 13

a) Give 5 reasons why forages might be more sustainable than row-crop farming systems

a) Give 2 reasons why forages might be less sustainable than row crop farming systems

Question 14

The following diagram shows a typical regrowth pattern for a pasture.



- Label (X-A) a point on the line which would show the situation that might exist after a field had been cut for hay.
- Label (X-B) a point on the figure which would have the highest growth rate
- Label (X-C) a point on the figure which would have the poorest pasture quality
- If the pasture were cut to a residual mass of 1200 kgDM/ha, how many days would it take to regrow to a mass of 2000 kgDM/ha?
- What would be the ideal mass to cut or graze?

Question 15

In 5 sentences describe how information gained from HCS412 might be useful in your future career.

a)

b)

c)

d)

e)