Answers
Mid-Quarter Exam HCS412 – Forages

Question 4

a) … *Photosynthesis ……..*
b) … *Rubisco ……*
c) ….*Warm-season …..*
d) … *Hydrogen ions ……*
e) … *Magnesium ions …*

Question 5

a) *…fertilizer, N-fixation, atmospheric deposition (pollution), organic matter*
b) *Plant and animal products, leaching, volatization,*
c) *The ability of the soil to provide the nutrients required for plant growth*
d) *Soil fertility is the basis for plant and animal production*
Its components include:
The chemical composition – provision of nutrients
The physical structure - allows rooting, water movement and oxygen diffusion
Biological activity – rate that organic materials (and nutrients) are (re)cycled
the geological origin/parent material

Question 6

a) *Increases pH, OH removes H+, increases CEC, adds Ca which can displace Mg, improves soil structure*
b) *Increasing CEC increases nutrient availability*
Good soil structure allows rooting, water infiltration and water holding capacity
Dolomitic lime adds essential Mg

Question 7

a) *12,000 x 0.025 = 300 lbK/ac/yr*
b) *300/0.83/0.19 = 1902lb fert/ac/yr*
c)

Fertilizer form	%K_2O	$/ton	$/lb K_2O
19-19-19	19%	$209.05	a) *209.05/2000/0.19 = 0.55 $/lb K_2O*
6-15-40	40%	$170.38	b) *170.38/2000/0.40 = 0.21 $/lb K_2O* ***
12-31-20	20%	$199.62	c) *199.62/2000/0.20 = 0.50 $/lb K_2O*

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

12.1 b
12.2 c
12.3 a
12.4 b
12.5 a
12.6 c
12.7 b
12.8 c
12.9 b
12.10 b

Question 9

a) *alfalfa, red clover, white clover*
b) *Rhizobia*
c) *200/0.46 = 434.78 lb fert/ac/yr*
d) *434.78 x 186/2000 = $40.43/ac/yr*
e) *Resultant rate = initial rate - suppression = 200 – 100/2 = 150 lbN fixed/ac/yr*

Question 10

a) *Photosynthesis, tiller initiation, short inter-nodes in clover*
b) *Etiolation, tiller suppression, increased internodes*
c) *Green light is reflected or transmitted*
d) *Cold (freezing) period required to initiate flowering*
e) *They require long days (short nights) to flower*

Question 11

a) *Intercellular fungus*
b) *Ryegrass or fescue (or others)*
c) *All legumes, orchardgrass, Kentucky bluegrass*
d) *Slowed growth, elevated temperature, fescue foot, staggers*
e) *Contaminated seed, buried seed, hay, seed in manure, plants surviving cultivation*
f) *Endophytes with no ergovaline*

Question 12

a)
i) ……*ecosystem services*……..
ii) ……*economics*……..
iii) ……*resource protection*……..
iv) ……*plant and animal diversity*

b)
i) ……*less fertilizer*……
ii) ……*less compaction* ……..
iii) ……*N-fixation*……..
iv) ……*lower costs*……..
v) ……*less fossil fuel*……..
vi) ……*less labor*……..

Question 13

a) *N*
b) *P*
c) *S*
d) *N*
e) *P*

Bonus question

a) Label all the meristematic areas on the diagram? (5)

b) How is knowledge of the location of meristematic areas usefull? How does the location of the meristematic areas influence plant growth and its response to the environment? (5)

Site of cell division and expansion – hence plant growth, no meristems = no growth
Mediate light response
"implicit" in endophyte spread
plant response to temperature
sensitive to disease
plant dispersed by vegetative spread
apical dominance effects
source of root growth