UNIT - FORAGES

Lesson 2: Important Forage Plants

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Not all forage plants are suitable for all production situations. Each has distinct advantages and disadvantages. The selection of forage crops to be produced should be based upon their adaptation to your soil and climatic conditions and their intended use. Have students review the differences between a grass and a legume. Ask students which grasses, legumes and grass-legume mixtures are grown in their areas. List these on the board as students suggest them.

C. Assignment

D. Supervised Study

E. Discussion

Ask students to distinguish a cool season grass from a warm season grass. Write down their suggestions.

What are the differences between cool season grasses and warm season grasses?

1) Cool season grass
   a) Rapid growth during cool, moist periods of the year
   b) Usually dormant during hot, dry summer months
   c) Able to survive low temperatures

2) Warm season grass
   a) Major growth during the warmer part of the year
   b) Usually dormant during cool periods
   c) Unable to survive low winter temperatures

2. Have students examine fresh or dry specimens (plant bodies, flowers, and seeds) of cool season perennial grasses. Use slides in addition to actual specimens. After students have examined the plant specimens, write the name of each grass on the board and list its advantages and disadvantages as students suggest them.

What are some cool season perennial grasses and their advantages and disadvantages?

1) Tall fescue
   a) Advantages
      (1) Adapted to a wide range of soil and climatic conditions
      (2) Well adapted to shallow, droughty ridge soil because of high resistance to drought
(3) Survives on wet, poorly drained soil
(4) Easy to establish a satisfactory stand
(5) Can be grazed closely
(6) Combines well with legumes
(7) Good regrowth after harvesting
(8) Resistant to trampling damage in low, wet areas
(9) Best used for pasture

b) Disadvantages
(1) Lack of palatability, especially for hay and silage
(2) Fescue toxicity
(3) Possibility of physiological disorders in livestock, i.e. "fescue foot"
(4) Very competitive with associated legumes
(5) Dormant during periods of high temperatures

2) Smooth bromegrass
a) Advantages
(1) Best adapted to regions of high to moderate rainfall and relatively cool summer temperatures
(2) Best adapted to deeper, better soils
(3) Very winter hardy and drought resistant
(4) Palatable to all classes of livestock
(5) Fits well into grass-legume mixtures
(6) Used for pasture or hay

b) Disadvantages
(1) Seed fluffy and difficult to sow
(2) Slow establishment
(3) Cannot stand extended periods of hot, dry weather
(4) Weakened by heavy grazing
(5) Low productivity when grown along with nitrogen
(6) Low productivity in second and third growth

3) Orchardgrass
a) Advantages
(1) Adapted best to rich soils; relatively well adapted to light soils of medium fertility and to moist, heavy lands
(2) More tolerant to heat, drought, and low fertility than bromegrass
(3) Shade tolerant
(4) Rapid establishment
(5) Rapid regrowth after cutting or grazing
(6) Good second and third growth
(7) Used primarily for pasture in association with legumes

b) Disadvantages
(1) Only moderately winter hardy
(2) Coarse and unpalatable at maturity
(3) Less nutritious than bromegrass or timothy
(4) Very competitive with legumes
(5) High nitrogen requirement for good production in pure stands

4) Kentucky bluegrass
a) Advantages
(1) Well adapted to the glacial and loessal (windblown) soils
(2) Most productive during cool, moist spring and early summer
3. Have students examine fresh or dry specimens (plant bodies, flowers, and seeds) of warm season perennial grasses. After the students have examined plant specimens, write the name of each grass on the board and list its advantages and disadvantages as students suggest them.

What are some important warm season perennial grasses and their advantages and disadvantages?
1) Switchgrass
   a) Advantages
      (1) Adapted to soils that are medium-textured to sandy
      (2) High yield in late spring and early summer
      (3) Easy to seed
      (4) Abundance of high quality seed
      (5) Easy to establish a satisfactory stand
   b) Disadvantages
      (1) A warm season producer only
      (2) Less palatable at maturity
      (3) Poor competition with other grasses
      (4) Poor regrowth potential

2) Big bluestem
   a) Advantages
      (1) Adapted to moist, well drained loams of relatively high
          fertility
      (2) Good summer forage production
      (3) Highly palatable to all classes of livestock
      (4) Makes good quality hay if mowed before seed heads
          emerge
      (5) Tolerant to close grazing with good recovery if
          protected during the first part of the season
   b) Disadvantages
      (1) Slow establishment
      (2) Warm season producer only

3) Indiangrass
   a) Advantages
      (1) Provides quick ground cover after seeding
      (2) Productive hay crop
   b) Disadvantages
      (1) Not widely grown
      (2) Judgment should be used in applying nitrogen because
          excessive amounts or application at the wrong time will
          stimulate weedy grasses that are detrimental to stands.
      (3) Should not be grazed until it reaches eight to ten inches
          in height
      (4) Avoid overgrazing

4. Have students examine fresh or dry specimens (plant bodies, flowers, and
   seeds) of annual grasses. After students have examined plant specimens,
   write the name of each grass on the board and list its advantages and
   disadvantages as students suggest them.

What are some important annual grasses and their advantages and
   disadvantages?

1) Sundangrass and its hybrids
   a) Advantages
      (1) Provides abundant grazing during the warm summer
          months
      (2) Best adapted to deep, moderately to highly fertile soils
      (3) Drought resistant
      (4) Can be used as warm season emergency or supplemental
          pasture, hay, green chop or silage
b) Disadvantages  
   (1) Has to be established every year  
   (2) A relatively warm growing season required for best results  
   (3) Susceptible to low temperatures  
   (4) Heavy user of nitrogen  
   (5) Prussic acid poisoning of livestock  
   (6) Difficult to cure as hay  
   (7) Nitrate poisoning in dry seasons  
2) Small grains  
   a) Advantages  
      (1) Easy stand establishment  
      (2) Provides early spring grazing, late fall grazing and winter grazing  
   b) Disadvantages  
      (1) Must be planted every year  
      (2) Costly ground preparation  
      (3) Soil erosion  

5. Have students examine fresh or dry specimens (plant bodies, flowers, and seeds) of important legumes. Use slides if available. After students have examined plant specimens, write the name of each legume on the board and list its advantages and disadvantages as students suggest them.

What are some important legumes and their advantages and disadvantages?

1) Alfalfa  
   a) Advantages  
      (1) Adapted to a wide range of climatic conditions  
      (2) Grows best on deep, well drained, fertile soils  
      (3) Provides abundance of nutritious feed  
      (4) Long-lived stands, if properly managed  
      (5) Drought resistant  
      (6) Can be grown alone or in mixtures with grasses  
   b) Disadvantages  
      (1) Does not thrive on acid or non-fertile soils  
      (2) Relatively expensive seed  
      (3) Problem of bloat if pastured  
      (4) Stands reduced or destroyed by winter killing  
2) Red clover  
   a) Advantages  
      (1) More winter hardy than alfalfa  
      (2) Grows better than alfalfa or sweet clover on soils slightly acid or on soils that are not too well drained  
      (3) High yields of nutritious forage the first year after seeding  
      (6) Rapid stand establishment  
   b) Disadvantages  
      (1) Short-lived in pasture mixtures (Most red clovers are biennial.)  
      (2) Reduced production during drought  
      (3) Expensive seed
3) **Ladino clover**
   a) **Advantages**
      (1) Hardy, less injured by winter heaving
      (2) Tolerates wetter soils than alfalfa
      (3) Very productive
      (4) High in minerals, rich in protein and vitamins, and low in fiber
      (5) Re-establishes itself by natural seeding
      (6) Ideal legume in numerous grass-legume pasture mixtures
   b) **Disadvantages**
      (1) Susceptible to long periods of severe drought
      (2) Possibility of bloat problems
      (3) Poor germination if planted too deep
      (4) Continuous grazing will kill out the stand
      (5) May have a laxative effect on the animal

4) **Birdsfoot trefoil**
   a) **Advantages**
      (1) Adapted to a wide range of soil conditions (moisture, pH, and fertility)
      (2) Feeding value comparable to alfalfa
      (3) Palatable to most classes of livestock
      (4) Can reseed itself when conditions are favorable
      (5) Good growth during summer due to deep root system
      (6) Can persist better under heavier grazing than alfalfa or red clover
      (7) No bloat problem
   b) **Disadvantages**
      (1) Difficult to establish good stands
      (2) Slow establishment
      (3) Slow recovery after grazing
      (4) Weak-stemmed when grown alone and lodges easily
      (5) Easy shattering of seed

5) **Sweet clover**
   a) **Advantages**
      (1) Adapted to wide range of soil and climatic conditions
      (2) Winter hardy
      (3) More resistant to heat and drought than alfalfa
      (4) High yielding and excellent for pasturage when many pasture plants are dormant
      (5) Low priced seed
   b) **Disadvantages**
      (1) Not liked by animals when they are first turned on sweet clover
      (2) Spoiled hay or silage may cause "bleeding disease" in cattle
      (3) Makes poor hay
      (4) Lacks good recovery after cutting
      (5) Less palatable due to the coumarin content
      (6) Very susceptible to black stem, root rot and virus diseases

6) **Lespedeza (Korean)**
   a) **Advantages**
      (1) A productive warm-weather annual
(2) Especially suitable for use on pasture soil of low fertility
(3) Quite resistant to drought
(4) Fast to obtain good stands
(5) Relatively low seed price
(6) Good quality hay, easy to cure
(7) Excellent source of pasturage for all classes of livestock

b) Disadvantages
(1) Slow growth in the spring
(2) Not tolerant to cold weather
(3) High summer temperatures and relatively high humidity necessary for the best growth
(4) Slow development of the best stands (do not develop until the third year after seeding)

7) White clover
a) Advantages
(1) Excellent pasture, combines well with grasses
(2) Can be grown on a variety of soils
(3) Re-establishes itself by natural seeding
(4) Will stand close grazing

b) Disadvantages
(1) Sensitive to drought
(2) Lower yields than Ladino
(3) Can cause bloat
(4) Establishment difficult

F. Other Activities

G. Competency

Identify major advantages and disadvantages of important forage crop plants.

H. Answers to Evaluation

1. 3 Alfalfa 1 Tall Fescue
   1 Bromegrass 3 Birdsfoot Trefoil
   1 Timothy 1 Orchardgrass
   3 Ladino Clover 3 Sweet Clover
   2 Switchgrass 3 Lespedeza

2. b. Sundangrass

3. b. It does not have the bloat problem.

   Identification key must be provided by the instructor.