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Forage Crops

Introduction

These are plants which are either grown naturally or cultivated by man to be used for feeding livestock.

(i) Fodder crops are purposely grown for feeding livestock; they are cut or uprooted when ready.

(ii) Pasture is a ground cover of grass or mixture of grass and legumes grazed directly or cut and fed to livestock.

Classification of Pastures

(i) According to length of time the pasture is maintained e.g. temporary or permanent.

(ii) According to ecological zones e.g. low altitude, medium altitude and high altitude pastures.

(iii) Examples of grasses are Napier, Rhodes, Setaria, Molasses, Congo Signal, Kikuyu, Star, Guatemala, Sudan and Guinea.

(iv) Examples of legumes are lucerne, clover, desmodium, glycine, stylo and centro.

Pasture Establishment

(i) Seedbed preparation
This involves clearing the land, primary and secondary cultivation to a fine tilth because seeds are very small. This is done during the dry season.

(ii) Selection of planting materials
Select seeds of high germination percentage, free from impurities or buy certified seeds. If vegetative materials are used, select from high yielding, vigorous-growing and healthy plants.

(iii) Treatment of legume seeds
Legume seeds are inoculated with the correct strains of bacteria which fix nitrogen in the root nodules.

(iv) Planting
- This is done at the beginning of the rains.
- Methods of sowing are direct sowing, under-sowing and over-sowing.
- Seed rate depend on purity of seeds, pasture plant species and whether pure or mixed stand.
- Apply phosphatic fertiliser when planting and later topdress with nitrogenous fertiliser.

Pasture Management

(i) Re-seeding or gapping. This is done if the grass is completely denuded, but if partially, gapping can be done.

(ii) Control of weeds by slashing, uprooting and mowing.

(iii) Fertilisation of pastures. This is done by use of manures as topdress.

(iv) Control of pests. This is done in various ways e.g. trapping of moles, use of pesticides and by biological means.

(v) Controlled grazing. This is done by paddocking, strip grazing and tethering. This maintains pastures productivity for as long as it is required.

Pasture Utilisation

Pasture is utilised in the following ways:
(i) Direct grazing.
(ii) Zero grazing, i.e. pasture is cut and fed to the animal in the stall.
(iii) Conserved to be used later.

Forage Conservation

Forage can be conserved as hay, silage and standing forage. Importance of forage conservation:
(i) To reserve excess forage for use during time of shortage.
(ii) To avoid unnecessary wastage of forage.
(iii) Conserved forage can be sold.
(iv) To have sustained supply of feed for livestock throughout the year.

Methods

(a) Hay making
This is the dehydration of green pastures to a moisture content of 16-20 per cent. Steps in hay-making:
(i) Cut the crop when the sun is shining.
(ii) Dry the materials for 1-2 days.
(iii) Windrow the dry material to allow for further drying.
(iv) Bale the dry materials for storage
(v) Store under shed or shelter.

Factors determining quality of hay.
(i) Stage of growth at which forage is harvested.
(ii) Leaf content of the forage material.
(iii) Method of handling and curing the materials.
(iv) Form in which material is fed to livestock.
(v) Species of forage used.
(vi) Amount of foreign materials in forage.

(b) Silage making
This is a feed produced by conserving forage in succulent form through the process of fermentation by anaerobic bacteria. Steps in silage making:
(i) Cut the crop and transport it to the silo.
(ii) Material with a high moisture content is wilted in the sun for 4-48 hours before ensiling.
(iii) Material is chopped to reasonable size pieces before filling the silo.
(iv) Spread the chopped material evenly.
(v) Check temperature if below 31°C, needs further filling; if above 31°C, compaction is necessary.
(vi) Filling should be complete by the end of third or fourth day.
(vii) The silo is covered with 15cm of straw, sawdust then 15cm of soil to make it air and water-tight.

A trench is dug round the silo to keep off surface water.

Factors affecting quality of silage.
(i) Maturity stage of the crop when cut.
(ii) Type of crop.
(iii) Moisture content of the material.
(iv) Additives e.g. molasses.
(v) Degree of compaction.
(vi) Size of the pieces ensiled.
(vii) Amount of foreign materials included in the silage.
(viii) Amount of leaf of the ensiled material.

Standing Forage

This is forage left in the field to be used during the dry season.

Common Fodder Crops

1. *Edible Cana*
   Altitude: 0-1300m above sea level.
   Establishment: Young tubers or bulbs are used.
   Spacing: 1m x 1m.
   Management: Does well on application of farm yard manure and requires fertile soil.
   Utilisation: Tops and tubers sliced and fed to livestock.
   Conservation: Bulbs or tubers sliced and stored.

2. *Napier grass*
   Ecology: 0 - 2100m above sea level.
   Establishment: Stem cuttings or roon splits. Spacing of 1m x 50cm.
   Management
   - Apply phosphatic fertilisers during planting time.
   - Top-dress with nitrogenous fertilisers in split application.
   - Clean weeding.
   - Cut when 6 - 8 weeks or 1m - 1.5m in height.

   Utilisation: Cut stem is fed to livestock.
   Conservation: Ensiled when plenty.
   - Standing forage.

   Types: Banagrass (broad-leaved and hairless on stem).
   - Clove is (thin-stemmed and hairless on sem).
   - Frech cameroon.
   - Pakistan hybrid (thin-leaved with hairy leaves).

   lage making.

3. *Lucerne*
   Ecology: 0-2750m above sea level. Deep red soil ideal.
   Establishment: Inoculated seeds planted 30-50cm apart in the rows.
   Management: Weeding and fertilisation
   Utilisation: Cut wilted and fed to livestock before flowering stage.
   Conservation: Hay, silage, dried materials e.g. as cubes or pencils.

4. *Mangolds*
   Is a root crop. Root is utilised as livestock feed.
   Ripe ones are used.

5. *Kales*
   Leaves used as livestock feeds.

6. *Guatemala grass*
   Leaves and stems are used as livestock feed.

WORK TO DO

1. (a) What is a forage crop.
   (b) Distinguish between a pasture crop and a fodder crop.
2. Give the various plant species that are used to establish pastures.
3. (a) Why is it important to inoculate legume seeds before planting?
   (b) Describe the procedures followed in legume seed inoculation.
4. Explain the management practices which are undertaken to maintain pasture's productivity as long as it is desired.
5. Name three ways in which established pastures are utilised.
6. Describe the procedure in:
   (a) hay-making.
   (b) silage-making.
7. Describe the production of napier grass under:
   (a) Land preparation,
   (b) Propagation and planting.
   (c) Fertiliser use.
   (d) Weed control.
8. Differentiate between undersowing and oversowing in forage crops.
9. List 4 pasture crops and 4 fodder crops.
10. Explain how the following can be utilised as livestock feeds:
    (a) Mangolds
    (b) Edible cana
    (c) Desmodium.