LECTURE 30

FORAGE CROPS, FORAGE GRASSES AND LEGUMES - IMPORTANCE, SOIL AND CLIMATIC REQUIREMENT, AGRONOMIC PRACTICES, TIME OF HARVEST, BIOMASS PRODUCTION AND NUTRIENT CONTENT

Importance of forages

- Agriculture is the art and science of crop & animal production
    - Crop production is also to animal production
    - Animal production in turn for crop production
- Animal population need to be re-oriented
    - Unproductive to be given away
    - We have approximately
        - 20% of world's cattle
        - 50% of buffaloes
        - More than 120 million goats and
        - 60 million sheep (Deb Roy, 1993)
- Natural gracing is limited
    - Crop wastes are recycled & but limited
- Hence
    - Exclusive cultivation and agronomic managements like
        - Control of bushes and weeds
        - Pasture establishment
        - Introduction of legumes/grasses
        - Fertilizer application
        - Cutting and grazing management are need of the hour

Forage grasses

Guinea Grass – *Panicum maximum*

- Season & varieties
    - Throughout year – CO 1
- Field preparation
    - Well drained soil with ridges & furrows, not at heavy clay
    - FYM 25t

- Seed rate
    - 2.5 kg /ha, Slips - 66,000 nos.
- Spacing
    - 50 x 30 cm
- Fertilizer
    - 50-50-40 NPK
    - 25 kg N at every cut
- Harvest
    - First cut at 75 DAS or 45 DAP, then at 45days
    - Green fodder 175 t from 8 cuts
    - May be intercropped with Hedge Lucerne for nutritious fodder

Blou Buffel Grass / Anjan grass - *Cenchrus glaucus*

- Season & varieties
    - NE Monsoon – CO 1 (Neela Kolukkattai)
- Field preparation
    - Well drained soil high ca content with ridges & furrows
    - FYM 25 t
- Seed rate
    - 6-8 kg /ha
- Spacing
    - 50 x 30 cm, sow at shallow depth, break seed dormancy
- Fertilizer
    - 25-40-20 NPK
    - 25 kg N at every cut
- Harvest
    - First cut at 75 DAS, then 4-6 cuts depending upon growth
    - Green fodder 40 t from 4 cuts

Bajra Napier Hybrid

- Season & varieties

  BN 2, NB 21, CO 1, CO 2
- Field preparation
    - Well drained soil with ridges & furrows – not at heavy clay

    - FYM 25t
- Seed rate
    - 40,000 slips
- Spacing
    - 50 x 50 cm
- Fertilizer
    - 50-50-40 NPK
    - 100 N kg after each cut
- Harvest
    - Cut at 75-80 DAP subsequent at 45 days interval
    - Green fodder 250 - 400 t

Deenanath Grass - *Pennisetum pedicillatum*

- Season & varieties
    - Throughout the year – CO 1
- Field preparation
    - Well drained soil with ridges & furrows
    - Heavy clay or water logging not suitable
    - FYM - 25t
- Seed rate
    - 2.5 kg
- Spacing
    - 30cm solid row
- Fertilizer
    - 40-60-40 NPK
    - 20 N kg on 30th DAS
- Harvest
    - 55-60 DAS
    - Green fodder 40 - 45 t also as rainfed 20-25 t

Para grass / Water grass / Buffalo grass - *Brachiaria mutica*

- Season & varieties
    - Thru' year
- Field preparation

    - All type of soils more suited to moist and waterlogged soils
    - FYM 25t
- Seed rate
    - 40,000 slips
- Spacing
    - 50 x 50 cm
- Fertilizer
    - 20-40-0 NPK
    - 20 N kg after each cut
- Harvest
    - Cut at 60-90 DAP subsequent at 30-45 days interval
    - Green fodder 200 - 240 t

Other grasses

- Marvel grass
    - *Dicanthium annulatum*
- Rhodes Grass
    - *Chloris gayana*
- Elephant grass / Napier grass
    - *Pennisetum purpureum*
- Johnson grass
    - *Sorghum helepense*
- Sudan grass
    - *Sorghum sudanense*

Forage legumes

Lucerne - *Medicago sativa*

- Season & varieties
    - Thru' year , CO 1
    - Not suitable for very hot and cold climate
- Field preparation
    - Apply 12.5 t FYM
    - Beds & channels 10- 20 m

- Seed rate
    - 20 kg /ha of cuscuta free seeds
- Spacing
    - 25cm with solid row
- Fertilizer
    - 25-120-40 NPK
- Harvest
    - First cut at 75-80 DAS, subsequent cut at 25-30 days
    - Green fodder
        - 70-80 t in 10 cuttings

Hedge Lucerne – *Desmanthus virgatus (Velimasal)*

- Season & varieties
    - Thru' year , Velimasal
- Field preparation
    - Apply 12.5 t FYM
    - Ridges & Furrows
- Seed rate
    - 20 kg /ha
- Spacing
    - 50cm with solid row
- Fertilizer
    - 10-60-30 NPK - to be applied below the seed rows
- Harvest
    - First cut at 90 DAS at 50cm ht , subsequent cut at 45 days
    - Green fodder
        - 125 t

Hedge Lucerne +Grasses

- Grasses suitable are Guinea and BN Hybrids
- Ratio - 3:1
- First cut at 50 DAS and further at 45 d
- Cutting height of velimasal is 50cm
- Additional fodder yield of 100-125t

- Nutritious proportion

Stylo – *Stylosanthes scabra (Muyal masal)*

- Season & varieties
    - Jun, July to Sep, Oct, *S. hamata* annual & *S. scabra* perennial
- Field preparation
    - Apply 12.5 t FYM
    - Beds & channels
- Seed rate
    - 6 kg /ha
- Spacing
    - 30 x 15cm
- Fertilizer
    - 20-60-15 NPK - to be applied below the seed rows
- Harvest
    - First cut at 75 DAS at flowering, subsequent cuts
    - Green fodder
        - First year low subsequent years 30 t/annum

Fodder Cowpea

- Season & varieties
    - June, July – CO 5
- Field preparation
    - Apply 12.5 t FYM
    - Beds & channels
- Seed rate
    - 40 kg /ha
- Spacing
    - 30 x 10 cm
- Fertilizer
    - 25-40-20 NPK - to be applied below the seed rows
- Harvest
    - 50-55 days aftersowing(50% flowering)
    - Green fodder

- 18-20 t/ha
- As soon flowering starts

Sirrato - *Macroptilium atropurpureum*

- Drought tolerant pasture
- Compatibility with cereals & grass
- Native of C & S America
- Deep rooted perennial
- Trailing, hairy stems
- Can tolerate grazing pressure
- Can tolerate shade
- Wide range of soils

Multiple choice questions

1. Napier grass is native of _____
   a. Abyssinia b. Asia **c. Tropical Africa**
2. Crop comes up well under water undulated condition & with sewage water
   a. **Para grass** b. Guinea grass c. BN grass
3. Dominant grass species found in India, called as Anjan grass in India _____
   a. Guinea grass b. Stylosanthes **c. *Cenchrus***
4. The planting of a hectare would need about _____r ooted sets of BN Hybrid
   a. 23000 b. 43000 c. **33000**
5. Queen of forage crops is _____
   a. **Lucerne** b. BN grass c. Guinea grass