



REPUBLIC OF KENYA



LEGUMINOUS PASTURES AND FODDERS FOR DAIRY





Introduction

Fodder is a bulky forage e.g napier grass, grown for livestock feeding. It is used specifically to feed domesticated livestock, such as cattle, rabbits, sheep, horses, chicken and pigs.

Unavailability of quality fodder is one of the factors limiting productivity and health of animals.

Protein source fodders should ideally comprise about 30% of the total daily animal feed intake.

Some of the benefits of growing high protein fodders include;

- Increased milk production and also contributing to reduction in methane emissions.
- Fodders containing proteins, for example lucerne, sweet potato vines etc, can significantly reduce the cost of concentrate supplementation.

- Improved animal growth rates, improved reproductive efficiency and improved feed intake by providing greater feed efficiency.
- Nodules on legume roots are able to fix nitrogen (N) from the air and this improves grass when grown as a mixed ley.

Common fodders rich in protein include:

SWEET POTATO VINES – *Ipomoea batata*.

Drought resistant, palatable and highly digestible fodder. Varieties like Kemb10, Ksb 20, Ex-Mukurweini, Saparo and Ex Msinya produce a lot of fodder material.

Spacing: 50 x 50 cm for faster ground cover formation is preferred.

Seed rate: About 16,000 vines (1ft long)/acre.

Planting: Dig hills of soil 15cm deep and plant when the soils are wet. Cut vines of 30 – 60cm long and bury 3/4 in the soil. Put a handful of manure per hole mixed with planting fertilizer at the rate of 60kg per acre.

Maturity: 3-4 months.

Yields: About 12-14 tons of fresh vines/ha/year. Cutting interval of 2-3 months depending on the weather.

Feeding: Chop the vines in small pieces and mix with grasses and other fodders e.g silage, napier grass etc up to 50% of the feed.



Sweet potato vines

LUCERNE - *Medicago sativa*.

High yielding perennial forage legume that grows upright to about 1 meter height under good husbandry.

Good for conservation as hay or silage. Usually productive for 4 - 6 years. Generally grown on pure stand. Drought resistant deep rooted legume. Usually cut and wilted before feeding.

Rainfall: Well distributed rainfall of 870 mm and above.

Soils: Well drained fertile soils. pH 6 - 6.5

Propagation: By use of seeds.

Planting: Normally drilled but can be broadcasted or sown at a depth of not more than 1 cm. Seedbed should be well prepared and firm for good germination

Seed rate: 6 - 8 kg/acre.

Spacing: 20 - 25 cm x drill

Maturity: 4 - 5 months depending on the weather.

Yields: 14 - 20 tons of dry matter (DM)/ha/year. Cutting interval of 4 - 8 weeks are feasible.

Feeding value: Crude protein (CP) 19-22%, DM 21%, Crude fibre (CF) 21%.



Lucern Crop

SWEET LUPIN. (*Lupinus spp*).

There are many varieties of sweet lupins but the common ones are *Lupinus albus* and *Lupinus angustifolius*. They are referred to as white and blue lupins respectively.

Soils: Prefers high rainfall, cool climate and tolerates low temperatures.

Seed rate: 12 - 14 kg/acre depending on the variety/size of the seed.

Spacing: 45 x 30 cm.

Maturity: 120-150 days.

Grain yield: Approximately 0.8 – 1.0 ton/acre.

Grains are milled for feed compounding.

Feeding value:

Usually crude protein (CP) 30-36%, DM 93% , crude fibre (CF) 4% Kcal/kg.

Disease/pest control: well drained soils, crop rotation and seed treatment minimize disease infections.

Use fungicide such as (Trianum®) to drench soil just after germination to control fungal infection like *fusarium wilt*. Spray twice within an interval of 2 weeks.

Note that *Lupinus angustifolius* is more susceptible to aphid infestation and many rodents eat them at early stages after germination.



Blue lupin crop



White lupin crop

DESMODIUM

Climber perennials legumes that have deep roots, long stems that branch freely and rooting at the nodes.

Tolerates low temperatures and is good for intercropping with Napier and Kikuyu grasses.

Both green leaf and silver leaf varieties are basically the same but the silver leaf has been reported to tolerate frost more than green leaf.

Rainfall: Well distributed rainfall of 870 mm and above.

Soils: Prefers light to clay loams, pH >5.0

Planting: Seedbed should be well prepared for good germination. Seeds may be broad casted or drilled, sown not more than 1 cm deep.

Propagation: By use of seeds, vine cuttings or root splits.

Seed rate: 2 kg seeds/acre or 16,000 vines per acre.

Spacing: 20 x 25 cm for seed or 50 x 50 cm for cuttings for faster cover (preference of 1 m ×1 m spacing can be used).

Yields: 12 - 19 tons of dry matter (DM)/ha/year.

Feeding value: CP 15-22%, DM 20-26, CF 25-30%.



Desmodium crop

COMMON VETCH (*Vicia sativa*)

Short term crop of high nutritive value, has a rapid growth rate and can be grown as pure stand or a mixed stand with grasses or fodders like oats, barley etc.

Soils: Should be well drained and not acidic. Neutral pH 6 - 7 is preferred.

Planting: A fine tilth, well prepared seedbed is important for good germination. Broadcast or drill the seed. Spacing of 45 cm x drilling is recommended.

Seed rate: 13 kg/ha in pure stand or 7 kg/ha when intercropped with grasses and fodders like napier grass, oats etc.

Maturity: Takes about 120 days for hay production.

Yields: Average hay yields of 4-6 tons DM/Ha of Vetch/Oat mixture

Feeding value: CP 17-22%, DM 89%, CF 30%.



Vetch crop

CALLIANDRA (*Calliandra calothyrsus*)

Used in agroforestry systems. It yields many products including fuel wood, fodder, fibre, shellac and provides shade, erosion control, weed control, soil improvement. Calliandra is also grown as an ornamental plant. Can be coppiced when it has reached a height of 2m, when it is normally 9-12 months after planting

Temperature range: Grows in regions with mean monthly temperatures of 18-28°C.

Rainfall: Annual rainfall ranges from 700 - 4000mm.

Soils: Light textured, slightly acidic soils

Altitude: Ranges from sea level - 2000m.

Planting: Either by direct sowing or by seedlings. Seedlings can be produced by sowing seeds in a nursery bed and allowing them to grow until they are 20 to 50cm high. The seeds should be sown at 1 to 3cm depth. Seedlings can be planted at a spacing of 2m by 1m. Soak the seeds for two days before planting.

Crude protein content (leaves and twines): 20-25%.

Yields; Annual forage yields of 7-10t/ha/year.



Calliandra fodder tree

TREE LUCERNE or TAGASASTE (*Chamaecytisus prolifer*)

This is a perennial legume shrub rich in crude protein and grows in medium warm altitudes and cold highlands (1500 – 2500 meters asl).

Rainfall: 600 – 1600 mm annually.

Seed rate: 40 g seed or (2,000 seedlings)/acre. Spacing 1 x 2 m along hedge rows, or 8 g of seeds (400 seedlings)/acre.

Spacing: 6 x 2 m as a normal spacing practice. Soak seeds in cold or warm water for 24 - 48 hours before planting to break the hard oily seed coat.

Maturity: 10 - 12 months at first coppicing.

Yields: The fodder shrub can produce 10 tons of leaf meal dry matter/ha/year.

One tree can produce 2 kg of leaf DM annually with a pruning interval of 8-10 weeks.



Tree Lucerne fodder tree

SESBANIA (*Sesbania sesban*)

Sesbania is a fast-growing, perennial legume tree, reaching a height of up to 8 m. It is a N-fixing shrub suitable as a soil improver.

Altitude: Grows best at 100-2300 m asl

Mean annual temperature: 18 - 23°C.

Mean annual rainfall: 500-2000 mm.

Soil type: Does best at pH range 5 – 7.

Planting: Scarification of seeds to break dormancy is needed by soaking the seed for 12 - 24 hours in warm water. As a fence it is planted at 1-2 m spacing in single rows or 2 m by 1 m in the main field.

It can attain a height of 4-5 m at 6 months after planting.

Yields: Vary from 4 to 12 t/ha DM per year.

Seed production can be as high as 1 - 2 t/ha.



Sesbania fodder tree

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