GROWING FODDER FOR LIVESTOCK: CALLIANDRA AND ELEPHANT GRASS

INTRODUCTION

As improved breeds of livestock become more available provision of better nutritive management will be more important. Pasture and fodder remain the cheapest form of animal feed available. Concentrates are only required at very high level of management. Pasture grasses and legumes however, vary in their nutritive value and productivity. Good animal production requires pasture and fodder species which give a high yield of palatable and digestive herbage, containing adequate nutrients.

Fodder crops are planted specifically to provide feed for cutting. They are cultivated and managed in the same way as arable crops. Useful fodder crops include:

- Calliandra spp - a leguminous plant
- Elephant grass
- Guatemala

Emphasis will be on Calliandra and elephant grass.

A) Calliandra calothyrsus

It is a leguminous plant. It grows well in a wide range of climatic and soil condition, but performs best in coffee zones. A well maintained and manured Calliandra can continuously produce fodder for 10 – 20 years! It is important to keep it free of weeds and fill the gaps in the early stages. Other uses include fuel woods, stakes, poles and bee forage, as well as helping in soil fertility improvement and soil erosion control, and serving as an ornament tree.

1. Choosing where and how to plant calliandra trees

The following sites on the farm can be appropriate for planting Calliandra:

**Boundary:** plant in both external and internal boundaries of the farm.
Along soil-conservation terraces: the deep roots help in stabilizing soil-conservation structures. This works best when Calliandra is combined with elephant grass. Plant Calliandra 0.5 meters above the elephant grass line.

In fodder banks: these plots are set aside for fodder production by farmers who have relatively big pieces of land.

In kitchen or home gardens: Calliandra hedges can be planted along the boundaries of such gardens.

Within elephant grass plots: plant 1 line of Calliandra after every 2 lines of elephant grass.

Calliandra hedges can be established in single rows, or in double rows.

2. Calliandra nursery and management

It is best to plant Calliandra first in a nursery and then transplant to the field. Make a shade structure 1 meter (3 feet) in height and cover lightly with grass or tree leaves ensuring that some light passes through. As seedlings grow, gradually reduce the shade to get the seedlings used to full sunlight. Using small polythene tubes is the best since this will allow easy transplanting.

3. Managing practices for Calliandra trees
   i) Planting Calliandra seeds in the field

Plants should be transplanted at the start of the rainy season when they are 20 – 30 cm high. Remember to remove the seedlings from the polythene tubes before planting them and ensure that they have some soil attached to their root, so as to improve their survival. Spacing should be 30 cm by 30 cm. place the seedlings up right in the prepare hole and fill the remaining space with a mixture top soil and manure. Compact the soil and manure mixture to make the seedling firm. Water the seedlings to enhance their chances of survival.
ii) Mulching

This is useful in areas with low rainfall or during the dry season. Do not place the mulch in direct contact with the trees, since the moist and cool environment it provides could encourage pests and diseases. Avoid mulching in areas with a heavy presence of termites, as this may increase damage of the trees by the insects.

iii) Weeding

The Calliandra tree grows very slowly after establishment, and it can easily be cocked to death by weed. The weeds compete with the tree for water and nutrients, and they also harbour pests. It is important, therefore, to keep the area around the tree clear of weeds.

iv) Protect the trees from animal damage

v) Annual application of manure

To enhance the growth of Calliandra tree, apply manure at least once every year, at the onset of rains. Each tree needs about 1 kg tin of decomposed manure mixed with ash. Spread manure along both sides of the hedges avoiding the soil to prevent the manure from damaging the plant’s roots.
vi) **Filling the gaps**

![Image: Fill the gaps to replace the lost trees]

vii) **Coppicing**

Coppicing involves cutting back the shoots close to the base of the tree so as to include new growth and production of multiple stem to give plenty of forage. The branches removed can be used as fuelwood or stakes, while leaves can be used as fodder. Coppicing is done when tree is growing vigorously.

The coppicing process and stages are as follows:

- The first coppicing is done when the tree reaches the height of about 2 meters (6ft) usually 9-12 months after planting. The tree is trimmed close to the ground level, at a height of about 15 cm (6inches). if the tree has more than one shoot, it should be cut back to a height of 1 meter.
- When the tree grow old and forage production falls, possibly at 7 years of age, coppicing would promote new growth and production of forage
- After cutting back the trees, the height of the hedge can be maintained at about 1 meter for ease of harvesting.

![Image: Cut back the tree to a height of 15 cm (6 inches)]

viii) **Protecting Calliandra against pests and diseases**

- **Scales:** are white, powdery insects that attack Calliandra stems. Scales can be controlled using washing detergents such as ‘Omo’ dissolved in water. Sprinkle on affected plants using leafy branches or a knapsack sprayer.
- **Black ants**; can seriously damage trees. They can be controlled by the methods used to control black ants.
- Others are crickets and hoppers which affect seedlings in nurseries, and Armillaria mellea a fungus that attacks roots of Calliandra plant causing root rot and eventual death. In such cases uproot and burn the infected plant. Avoid planting Calliandra where forests have recently been cleared.

4. **Calliandra for livestock fodder and other uses**

**i) Harvesting leaves to feed livestock**
- Frequent cutting of leaves stimulates vigorous regrowth and, hence, sustained supply of fodder.
- For livestock fodder, systematically cut both upright and spreading leafy branches and maintain the height of the hedges at about 1 meter (3ft).
- The best tool for harvesting forage is a pair secateurs. You can also use sickle, sharp panga or knife. **BUT avoid splitting the stem or wounding the tree.**
- Harvest from one end of the hedge and progressively move to the other end.

**ii) Feeding Calliandra for milk production**

To improve milk production of dairy animals, feed dairy animals with fodder legumes at the rate of 25 – 30% (about 1 part legume to 3 to 4 parts of the basal forage). Basal forage consists mainly of the grasses, elephant grass and maize Stover fed alone or in a combination. Calliandra contains of high level protein (20 to 25% crude protein), which is far more than the amount available in basal diet. On average, grasses contain about 8% to 10% protein in the wet season and less than 7% in the dry season. Protein is important in increasing milk production and maintaining good health. However, digestibility of Calliandra is low (about 40%) probably due to presence of chemicals known as tannins that bind to proteins and affect the ability of the animal to digest the proteins.

The tannin content is reduced if Calliandra leaves are wilted or dried before feeding. The leaves should be dried under shade so as to minimize the loss of nutrients.

**NB:** Excess feeding with leguminous species wastes valuable protein and may cause adverse effects on the health of the animal, such as bloating, or result in unfavorable flavor in milk. Therefore, it is important not to exceed the recommended rations when feeding your livestock.
Calliandra can also be fed to other livestock such as sheep, pigs, poultry and rabbits.

5. Limitations of using Calliandra

- If not managed properly, Calliandra trees can reduce crop production by shading the adjacent.
- Calliandra contains tannins that can lower the digestibility and absorption of feeds in animal’s digestive system.
- In some areas, the trees do not produce many seeds, and hence it may be difficult to propagate
- Calliandra cannot withstand frost or water logging, and it grows slowly in acidic soils.

B) Elephant grass

1) Climate and soils

Elephant grass is well adapted for planting in well – drained soils. It is very drought resistant and can be used as a dry season reserve in dry areas.

2) Establishment

Establishment is by vegetative means using canes with 3-4 internodes. These are inserted in the soil leaving one internode uncovered. Cane planting materials should be obtained from plants about to flower where the stems are still green. Splits can be used instead of canes. A fine seed bed is not necessary, but it is advisable to remove perennial weeds.

3) Varieties

A number of leafy varieties e.g. KW4 and P.99 are available at research institute (NARO). These varieties are high yielding with higher protein content (10%CP) compared to the local variety commonly found along the roadside (5%CP)

4) Spacing

Row planting with widths varying from 1-2m apart can be used. Spacing between plants should be 1m. Planting should be carried out in the rainy season.

5) Interplanting grass with legumes

Interplanting vigorous forage legume like: Centro, Siratro and desmodiam. The legume should be planted at a spacing of Desmodiam. The legume should be planted at a spacing of 1m x 1m and a seed rate of 1-4 kg/ha near the grass rows. This eliminates weeding.

6) Fertilizers

Elephant grass is highly sensitive to soil fertility conditions and it gives large responses to nitrogen fertilization, especially during the second and third years of growth. Apply 100-200kg / hectare of NPK. Other fertilizers are can and Urea. Cow dung is a very good source of nitrogen.
7) Weeding and inter-row cultivation

Weeding is very essential during the establishment of crop, and also later, to maintain the grass in vigorous and productive condition. Elephant grass which has been cut is very sensitive to weeds.

8) Diseases

Two diseases are commonly observed on cultivated elephant grass:

- **Stunting disease**

  A virus like condition in which part or the entire grass stool becomes stunted, pale green and much branded, eventually dying. The disease can be transmitted in the planting material; canes for planting should therefore be selected from only healthy parents. In the field the disease is spread by insects and cutting knives e.g. panga. HOWEVER, when the plot is well maintained and manured the loss of production can be reduced considerably.

- **White spot**

  A fungal disease commonly seen on the leaves of vigorously growing plants, particularly in wet weather. It has no obvious effect on yield.

9) Management for cutting

Cutting is best done when plants are 1-1.5m tall, at a cutting height of 2-5cm above the ground. The first cutting is possible 10 – 16 weeks after planting, at cutting intervals of 8 – 12 weeks depending on the soil moisture and soil fertility. After cutting, all the buried in furrows between the rows of elephant grass. Use of fertilizers helps to improve the productivity of the crop. Under a cut and a curry grazing, it is necessary to feed about 50-70kg of chopped elephant grass fodder to an exotic lactating dairy cow.

c) Other fodder plants include:

**Setaria grass.** This can easily be planted on erosion lines or as borders since it does not grow very tall. It is a nice crop to fill ‘lost spaces’ on the farm. Others are leucaena, desmodium and Lucerne and non-leguminous species like mulberry and sweetpotato vines.

**PROPAGATION OF FODDER PLANTS**

Can be by cane cuttings(elephant grass), shooting/root splits(elephant grass, guatamala and setaria) and seed(Calliandra, jack bean and mucuna bean)

<table>
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<tr>
<th>Crop</th>
<th>Distance between lines</th>
<th>spacing within lines</th>
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</thead>
<tbody>
<tr>
<td>Elephant grass</td>
<td>100 cm</td>
<td>60 cm</td>
</tr>
<tr>
<td>Guatamala grass</td>
<td>100 cm</td>
<td>60 cm</td>
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<tr>
<td>Plant Type</td>
<td>Height 1</td>
<td>Height 2</td>
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<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Setaria grass</td>
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<td>40 cm</td>
</tr>
<tr>
<td>Calliandra (hedge)</td>
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<td>30 cm</td>
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<tr>
<td>Mukuna beans</td>
<td>100 cm</td>
<td>40 cm</td>
</tr>
<tr>
<td>Jack beans</td>
<td>50 cm</td>
<td>50 cm</td>
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</tbody>
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(Source: Anam Care Education Farm)