

## HOW TO ESTABLISH FODDER

- Fodder crops are plants cultivated on arable land and grazed or fed to livestock green, or in a conserved form like hay or silage.
- They are the most important feed on smallholder farms, due to their high yield per unit area.

### Fodder suitable for your region must be:

- Adapted to climatic and soil conditions.
- Fast-growing and well adapted to frequent cutting and defoliation.
- Able to provide good soil cover and prevent weeds from growing.
- High in nutritive value i.e. high energy and protein-rich.
- Easy to conserve as hay/silage, or able to stay green during the dry season.
- Easy to establish from seed or vegetative material.
- Able to withstand infestation of pests and diseases.
- Able to grow well with other crops where intercropping is practiced.

# Establishing and managing different fodder crops

## 1. Napier grass

### a. Planting

- Established from root splits or canes.
- Can also be planted alone or intercropped with forage legumes.

The two methods of planting Napier grass are the conventional method and the tumbukiza method. These are illustrated below.

#### How to increase fodder yields



Prepare the land at the right time.



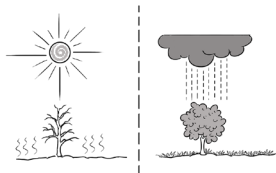
Protect the soil and enhance its performance.



Use certified seeds.



Use the right plant population.

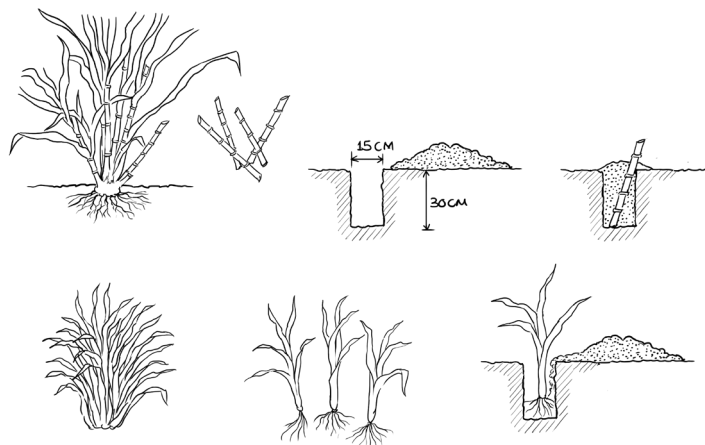


Plant resilient fodder varieties early to avoid the adverse effects of weather.

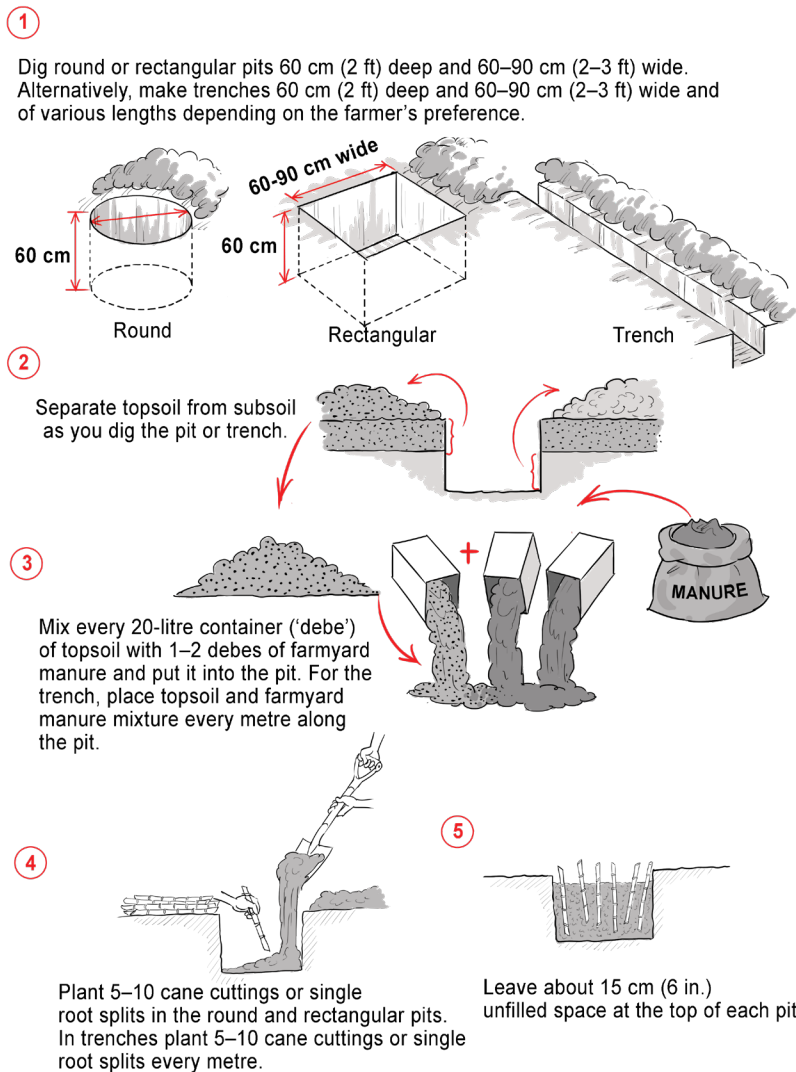


Control weeds, pests and diseases.

**Figure 1: How to increase fodder yields**



**Figure 2: Conventional method of planting Napier grass (Source: Lukuyu et al., 2012)**



**Figure 3: Tumbukiza method of planting Napier grass (Source: Lukuyu et al., 2012)**

### b. Fertilizer and manure management practices

- Use 1–2 bags of TSP (triple superphosphate) or DAP (diammonium phosphate) fertilizer per hectare at planting followed by 5–7 bags of CAN (calcium ammonium nitrate) fertilizer in three split applications per year. It should be applied after harvesting and weeding in subsequent years.
- 10 t/ha (5t/acre) of farmyard manure at planting. In the following years apply the same amount, preferably after every harvest.

### c. Harvesting

- Weed after each harvest to maintain high productivity.
- Harvest when 0.8 - 1 m high or every 6–8 weeks to obtain optimal grass quality.
- Maintain a stubble height of 5–10 cm from the ground level at each harvest to avoid weakening the root system, which otherwise leads to low production in subsequent harvests.

## **2. Fodder sorghums**

Sorghums are drought resistant and grow well in dry areas. Seeds are available from various SeedCo outlets.

### **a. Planting**

- Planting should be done at the start of the rains.
- At planting drill 25–35 kg of sorghum seed per hectare at a spacing of 30–40 cm from row to row. Alternatively broadcast the seeds.

### **b. Fertilizer and manure management**

- Use 1 bag of TSP (triple superphosphate) fertilizer per hectare during planting and top dress with 2–3 bags of CAN (calcium ammonium nitrate) fertilizer per hectare after cutting or grazing to stimulate new regrowth.

### **c. Harvesting**

- Sorghums should be cut every 6–8 weeks, when they are at dough stage.
- After 5–6 cuttings it becomes uneconomical to maintain the crop and the field should be ploughed and used for a different cultivation.
- Do not graze sorghum earlier than 6 weeks to avoid prussic acid poisoning of the livestock..

## **3. Fodder maize**

- Fodder maize is one of the best crops for making silage. There are a number of maize varieties that can be used in Kenya (e.g. DK - Monsanto - and Duma - SeedCo).
- In case other varieties are chosen, they should be early maturing varieties with a high biomass yield.

### **a. Planting**

- Maize requires a well-prepared seedbed to ensure even germination.
- Planting should be at the start of the rains.
- Plant with a spacing of 25–75 cm from row to row.

### **b. Fertilizer and manure management**

- Use 1 bag (50kg) of NPK (nitrogen, phosphorus, and potassium) fertilizer per acre during planting.
- Top dress with 2 bags (100kg) of CAN (calcium ammonium nitrate) fertilizer per acre.

### **c. Harvesting**

- Maize cannot withstand direct grazing and thus should be utilized as a green chop. It can also be conserved in the form of silage.
- Harvesting should be done between the milk and dough stages. Under good agronomic management, a biomass yield of 16t of fresh yield can be achieved per acre.

#### **4. Rhodes grass (chloris gayana)**

A vigorous, perennial grass, with a strong root system giving good drought tolerance. It spreads quickly forming good ground cover and grows up to 1.5m tall. It does well in low rainfall areas and is drought tolerant. It also withstands heavy grazing, is very palatable and is good for making hay.

##### **a. Planting**

- Plough and harrow the land at least once to make a fine seed bed.
- Sow immediately after harrowing.
- Sowing is usually established from seed but root splits can also be used.
- The best time to sow in regions where there are two rainy seasons is during the short rains to prevent seeds being washed away by water. Where there is one rainy season, plant from early to the mid-rains.
- Sowing is done when the soil is loose (dry).
- Make furrows 25 cm apart using a peg. Drill the seeds in the furrows, at a seed rate of 12 kg/ha (5 kg per acre).
- Cover the seeds lightly. For example, by pulling light tree branches over the furrows.

##### **b. Fertilizer and manure management**

- For high productivity, apply nitrogen fertilizers (CAN - calcium ammonium nitrate) preferably during heavy rains at the rate of 100 kg/ha.

##### **c. Harvesting**

- Start harvesting or grazing soon after flowering.
- Cut the grass close to the ground to stimulate spreading. Leave the grass after harvest to re-grow again until next flowering.
- When well-managed, Rhodes grass can yield an average of 8t/ha dry matter per year.

#### **5. Desmodium**

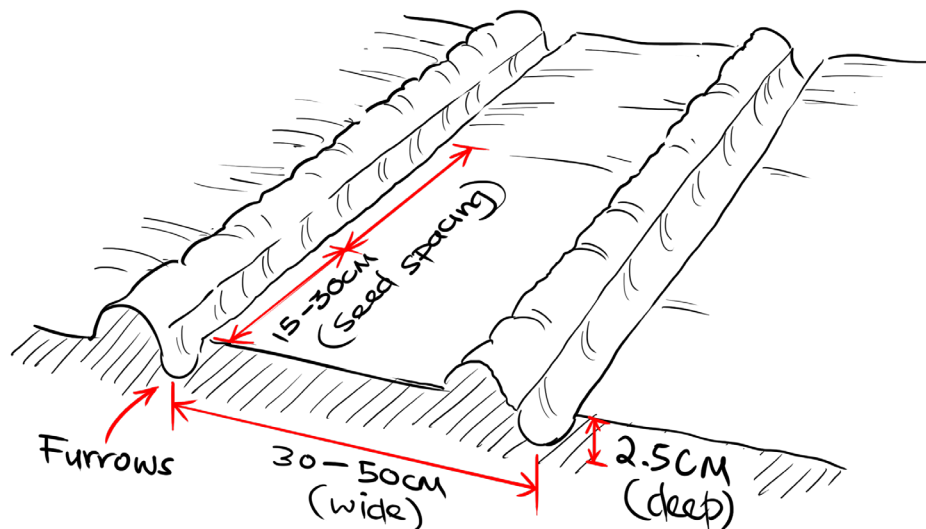
- Desmodium can be grown as a sole crop or as an intercrop with grasses.

##### **a. Planting**

- Two methods of establishing Desmodium are common: (i) from seeds and (ii) from cuttings.

##### **i. Establishment from seeds**

- Make a fine, firm and weed-free seedbed.
- Seedbed preparation should be done well before the onset of rains.
- Use 3–5 kg/ha (2 kg/acre) desmodium seeds.
- During planting, mix the seeds with 2 bags of TSP (triple superphosphate) or 4 bags of SSP (single superphosphate) fertilizer.
- Drill the seed into shallow furrows (2.5 cm deep and spaced at 30 cm or 50 cm) and them with little soil.



**Figure 3: Making fodder from seeds. (Source: Lukuyu et al., 2012)**

## ii. Establishment from cuttings

- Use mature parts of Desmodium vines.
- Use freshly cut vines.
- Bury 2 nodes leaving 1 or 2 nodes above the ground.
- Space at 30 cm or 50 cm from row to row and 15–30 cm from vine to vine.
- Use the same rates of fertilizer as for seed but place it in the planting holes.
- To maximize germination, check that there has been sufficient rain before you plant.

### a. Fertilizer and manure management

- Keep the stand free of weeds, especially during the early stages before the crop covers the ground.
- Top dress with 2–4 bags of TSP (triple superphosphate) or SSP (single superphosphate) fertilizer every year to maintain high yields of Desmodium herbage and seed.
- Spray against harmful pests, especially when aiming at producing Desmodium seed.

### b. Harvesting

- For herbage production, make the first cut about 3–4 months after planting. Subsequent cuttings should be at intervals of 6–8 weeks.
- Harvest the seed when the pods have turned brown by hand stripping the ripe pods and store it a dry place after threshing to avoid rotting.
- Cut and feed in green form or cut and conserve as hay, both as a whole or chopped

### **3. Lucerne**

- Dairy farmers in high-rainfall areas prefer Lucerne, primarily because of its palatability and high nutritive value that can sustain high milk production levels when fed to dairy cattle.

#### **a. Planting**

- Lucerne requires a fine, firm seedbed, prepared well before the onset of the rains. The subsoil should be well broken with a forked hoe. Apply 5tacre of well-composted farmyard manure or compost manure and dig it down to the subsoil.
- Make furrows which are 30–40 cm apart and 2.5 cm deep.
- Mix 10–15 kg seeds with 4–6 bags of SSP (single superphosphate) fertilizer or 2–4 bags of TSP (triple superphosphate) fertilizer and drill into the furrows. Cover the seeds with a little soil.
- Use 10–15 kg/ha Lucerne seed.
- In acidic soils (pH less than 4.9) liming with agricultural lime is recommended at the rate of 10 t/ha.

#### **b. Management**

- Weed control: hand weed at least 4–6 weeks after planting and thereafter whenever weeds appear.
- Spray against aphids and other pests with insecticides such as dimethoate at intervals of 2–3 weeks if necessary.
- Continue applying farmyard manure to a Lucerne field to improve soil fertility, structure, texture and herbage yields.
- Apply 1 bag of TSP (triple superphosphate) fertilizer per hectare annually.

#### **c. Harvesting**

- Harvest Lucerne when it starts flowering (about 30 cm high) to a stubble height of 4–5 cm from the ground level. One can obtain 6–8 cuts in a year.
- The crop can last up to 4 years under good management.
- Cut and feed Lucerne in green form after wilting to avoid bloating.
- Conserve the excess Lucerne as hay, whole or chopped.
- Conservation as silage is possible when combined with other types of fodder such as maize.

#### 4. Fodder trees

Fodder trees are used by small-scale dairy farmers as a cheap source of protein for dairy cows. Common types of fodder trees:

- Calliandra—Does well in upland areas with medium to high rainfall (700–2000 mm). It regrows well after cutting and harvesting.
- Leucaena—Does well in upland areas with medium to high rainfall. It is slightly more drought resistant but is more subject to attack by insect pests. Regrows well after cutting and harvesting.
- Sesbania—Grows better in high-rainfall areas and does better than other fodder trees in higher, cooler areas.

##### a. Planting

- To achieve good germination, break the dormancy by placing the seeds in hot water for 4 then soak them in cold water for at least 12 hours before planting them.
- Sow the seeds either directly into hedge rows at a spacing of 30–60 cm from plant to plant or in a nursery for later planting when they have reached a height of 60 cm.
- Plant on the hedgerows around the homestead, on contour lines in the field, or as part of soil conservation structures.

##### b. Management

- Apply 5g (1 teaspoonful) of TSP (triple superphosphate) fertilizer per hole during planting.
- Protect young trees from livestock.

##### c. Harvesting

- Cut trees when they are about 2 m tall, leaving a row of hedge 1 m high.
- Harvest every 3–4 months.
- Leave a few trees to grow tall for seed.
- For seed, collect pods when they start to turn brown, before they split open.
- Dry pods on a sheet or gunny bag.
- Store collected seed in a tin or plastic container with a strong lid.
- Leucaena: Start harvesting at the beginning of the second wet season by cutting back to 50 cm above ground level. Cut twice during the wet season when the regrowth is 50–60 cm, or once at the end of the wet season, and conserve as dry leaf meal. Grazing or harvesting intervals can be 6 to 8 weeks or 12 weeks in less favourable conditions. When well-managed, Leucaena can yield up to 2 t/ha dry matter per year.
- Calliandra: A well-established stand can be harvested 4 to 5 times a year with the harvesting interval varying with the rainfall. Cut again when the regrowth is 50–60 cm. Depending on rainfall and soil fertility, dry matter yields range from 5 to 10 t/ha per year. The edible fraction of Calliandra has a crude protein level of 20–25% of the dry matter.