

# Forage Legumes

*Forages play a crucial role in ruminant nutrition, providing essential nutrients such as fibre, energy and protein for livestock. Among the diverse range of forages available, certain categories exhibit unique characteristics and can contribute significantly to diets of dairy and beef cattle in the tropics. Understanding these forage categories and their role in dairy and beef nutrition is essential to optimize milk production, animal health, margin above feed cost and reduce enteric methane intensity.*

## Forage legumes

Forage legumes, such as *Lucerne*, *Desmodium*, *Lablab*, and agro-forestry trees like *Calliandra*, *Leucaena* and *Sesbania* possess several unique attributes that differentiate them from other forage categories.



Lucerne



Desmodium



Lablab



Calliandra



Leucaena



Sesbania

Fig 1: Selected Legume forages

Here are some key attributes unique to legumes:

### 1. Nitrogen fixation:



Fig 2: Nitrogen fixing nodes on a legume plant

One remarkable characteristics of legumes is their ability to engage in symbiotic nitrogen fixation. Legumes form a mutually beneficial relationship with nitrogen-fixing bacteria known as rhizobia, which reside in specialized root nodules. Through this symbiosis, legumes can convert atmospheric nitrogen into a usable form of nitrogen for plant growth. This nitrogen fixation capability allows legumes to contribute significantly to soil fertility and reduce the reliance on synthetic nitrogen fertilizers.

### 2. High protein content:



Fig 3: Image of a flowering lucerne plant

Compared to most other forages, legumes generally have a higher protein content. Legumes in addition often contain a balanced array of essential amino acids. This characteristic makes legumes a valuable source of high-quality protein for animal nutrition. Including legumes, dairy and beef rations, can increase the protein density of the ration.

### 3. Improved forage quality:



Fig 4: A farm with Calliandra inter-planted with nappier grass

Legumes possess good forage quality characteristics compared to tropical grasses. Next to higher protein content, they have lower fiber (NDF) content which makes them more digestible. The inclusion of legumes in dairy and beef diets can lead to improved rumen function, better feed efficiency, and overall improved animal performance.

### 4. Nutrient density:

Legumes, compared to the other categories, often have higher concentrations of minerals, vitamins, forages.



Fig 5: Cows eating lucerne

### 5. Forage Persistence:

In tropical cultivated pastures and grassland in Kenya perennial legume species can play an important role to

improve persistence and longevity of pastures and grassland. Legumes such as lucerne are known for their ability to withstand grazing pressure, persist under various environmental conditions but soil conditions such as acidity, available phosphorous, the correct inoculant and rootability of the soil limit the use of lucerne and other pasture legumes in Kenya.

### 6. Yield potential and expectation:

Yield is highly dependent on management of the forage crop, purpose of the cultivation i.e for forage production or for soil improvement, climate, soil conditions and will also differ with the specific legumes (some have higher yields than others).

### 7. Soil requirements

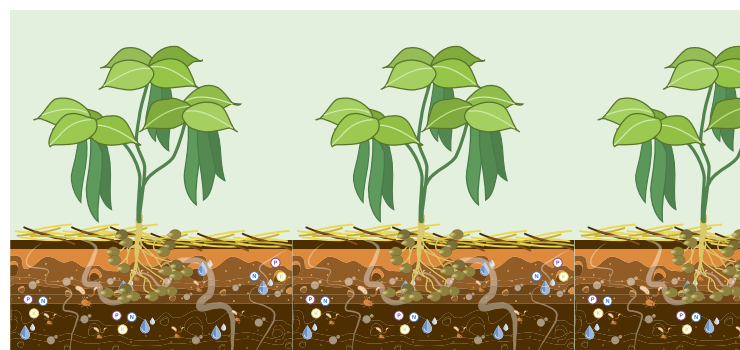


Fig 6: Healthy soil structure

Soil requirements are dependent on the area and again, management. Some areas in Kenya have been known to have acidic soils due to over fertilization over the years. Planting forages in such areas would require some form of corrective measures such as applying lime. But it should be emphasized that soil analysis should be done first before applying any corrective fertilizer.

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