

# Planting legume forages in lowland / semi-arid areas

## Why planting legume forage?



Stall feeding of a dairy cow in Eastern Kenya

Legume forage species are high in crude protein, and may improve significantly the maintenance (e.g. immunity) and productivity (e.g. growth, milk) of ruminant livestock.

Including legume forage in the ratio also improves the intake and digestibility of roughage, such as crop residues (i.e. more efficient use of crop residues).

Legume forage species fix atmospheric nitrogen, thus improving soil fertility (green manuring). Most species also cover the soil quickly with an abundant biomass, effectively controlling erosion and water runoff. Several species can also be intercropped with cereals such as maize or sorghum.

### SELECTED SPECIES WITH:

- High productivity
- Good forage value
- Ease of management
- Ease of inclusion in existing farming systems

**CIMMYT's mission is to sustainably increase the productivity of maize and wheat systems to ensure global food security and reduce poverty.**

**The centre applies the best science to develop and freely share:**

- High-yielding, stress tolerant maize and wheat varieties
- Large, unique collections of maize and wheat genetic resources
- Productivity-enhancing, resource-conserving farming practices
- Training information

## Few agronomic tips

**Scarification** - The seedcoat of legumes is often impermeable to water, thus slowing germination. The seedcoat can be cracked without damaging the embryo e.g. using sand paper or hot water.

**Sowing** - Forage establishment fails more as a result of sowing too deep than as a result of sowing too shallowly. Seed size and soil texture are important in determining sowing depth - the smaller the seed and the heavier the soil, the shallower the planting depth. In general, small seeds should be sown as close to the surface as possible, and larger seeds at 2-5 cm.

**Grazing/Cutting intervals** - Longer intervals between grazing/cutting may result in higher biomass productivity, but it also often result in lower nutritional value and palatability. Indeed, feeding value declines rapidly with age of regrowth, as increasing amounts of lignin are laid down. A green leaf residue should always be maintained after grazing/cutting: the initial rate of regrowth is directly related to the amount of leaf remaining to intercept light and support photosynthesis.

**Feeding** - Legume forage should be fed mixed with grass forage to avoid bloating

## Cajanus cajan



<b>Common name</b>		Pigeon pea			
<b>Plant description</b>		Annual to short-lived perennial, erect			
USES		CHARACTERISTICS			
Grazing	-	Nutritive value	+	Resistance to heavy grazing	-
Cut-and-carry	-	Palatability	+	Resistance to pests and diseases	-
Hay	--	Productivity	++	Spreading	--
Silage	-	Seed production	++		
Ground cover	+	Ease of establishment	+		
Green manure	++	Adaptation to poor soils	+		
Intercropping	+	Resistance to drought	++		

« *C. ternatea* is easy to establish - even on heavy clay soils and soils prone to surface crusting, - and is highly suitable for fertility restoration »

## Clitoria ternatea

<b>Common name</b>		Butterfly-pea			
<b>Plant description</b>		Perennial, climbing, strongly persistent			
USES		CHARACTERISTICS			
Grazing	+	Nutritive value	++	Resistance to heavy grazing	-
Cut-and-carry	++	Palatability	++	Resistance to pests and diseases	-
Hay	++	Productivity	++	Spreading (by seeds)	-
Silage	+	Seed production	++		
Ground cover	++	Ease of establishment	+		
Green manure	++	Adaptation to poor soils	+		
Intercropping	+	Resistance to drought	+		



## Dolichos lablab



<b>Common name</b>		Lablab bean			
<b>Plant description</b>		Annual, trailing			
USES		CHARACTERISTICS			
Grazing	-	Nutritive value	++	Resistance to heavy grazing	-
Cut-and-carry	+	Palatability	++	Resistance to pests and diseases	-
Hay	++	Productivity	++	Spreading	--
Silage	+	Seed production	++		
Ground cover	++	Ease of establishment	+		
Green manure	++	Adaptation to poor soils	+		
Intercropping	++	Resistance to drought	+		

## Macroptilium atropurpureum

<b>Common name</b>		Siratro			
<b>Plant description</b>		Perennial, trailing-climbing, taproot			
USES		CHARACTERISTICS			
Grazing	++	Nutritive value	+	Resistance to heavy grazing	+
Cut-and-carry	+	Palatability	+	Resistance to pests and diseases	--
Hay	+	Productivity	+	Spreading (by seeds)	+
Silage	+	Seed production	+		
Ground cover	+	Ease of establishment	-		
Green manure	+	Adaptation to poor soils	++		
Intercropping	+	Resistance to drought	+		



## Vigna unguiculata



<b>Common name</b>		Cowpea			
<b>Plant description</b>		Annual, trailing to erect			
USES		CHARACTERISTICS			
Grazing	-	Nutritive value	+	Resistance to heavy grazing	--
Cut-and-carry	-	Palatability	+	Resistance to pests and diseases	-
Hay	++	Productivity	+	Spreading	--
Silage	+	Seed production	++		
Ground cover	+	Ease of establishment	+		
Green manure	+	Adaptation to poor soils	-		
Intercropping	++	Resistance to drought	-		



A maize plant growing in a mulch of crop residues

## Enhancing productivity in mixed crop-livestock system of Eastern Africa

This IFAD-funded project is focused on resource-poor smallholder farmers in Ethiopia and Kenya. It aims at improving both crop and livestock production by reducing current competition on the use of cereal crop residues. On one hand, cereal crop residues are an essential source of feed for livestock, especially during the dry season. Livestock performs a number of function such as provision of animal traction, provision of manure, income generation and social display. On the other hand, the retention of cereal crop residue as surface mulch has the potential of increasing crop productivity and improving sustainability of cropping systems.