Planting legume forages in highland / sub-humid 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 is existing farming systems

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

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

Year 2011 • N°. 1
ILRI Sholla Campus • P.O. Box 5689 • ADDIS ABABA ETHIOPIA • Tel : (251-11) 6-462324 • Fax : (251-11) 6-172001 • Email : cimmyt-ethiopia@cgiar.org

CIMMYT
International Maize and Wheat Improvement Center

IFAD
Enabling poor rural people to overcome poverty

KARI

EIAR

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

Desmodium intortum

Common name Green-leaf desmodium
Plant description Perennial, trailing, strong taproot

USES		CHARACTERISTICS			
Grazing	-	Nutritive value	++	Resistance to heavy grazing	-
Cut-and-carry	++	Palatability	++	Resistance to pests	+
Hay	++	Productivity	++	and diseases	
Silage	++	Seed production	++	Spreading (by stolon)	+
Ground cover	++	Ease of establishment	-		
Green manure	++	Adaptation to poor soils	+		
Intercropping	++	Resistance to drought	-		

Desmodium unicinatum

Common name Silver-leaf desmodium
Plant description Perennial, trailing, strong taproot

USES		CHARACTERISTICS			
Grazing	-	Nutritive value	++	Resistance to heavy grazing	-
Cut-and-carry	++	Palatability	++	Resistance to pests	-
Hay	++	Productivity	+	and diseases	
Silage	++	Seed production	+	Spreading	-
Ground cover	++	Ease of establishment	-		
Green manure	++	Adaptation to poor soils	-		
Intercropping	++	Resistance to drought	--		

Dolichos lablab

Common name Lablab bean
Plant description Annual, trailing

USES		CHARACTERISTICS			
Grazing	-	Nutritive value	+	Resistance to heavy grazing	-
Cut-and-carry	++	Palatability	+	Resistance to pests	-
Hay	++	Productivity	+	and diseases	
Silage	+	Seed production	++	Spreading	--
Ground cover	++	Ease of establishment	++		
Green manure	++	Adaptation to poor soils	+		
Intercropping	++	Resistance to drought	+		

« ***M. axillare*** **tolerates low fertility, is drought resistant, and have little pest and disease problem »**

Macrotyloma axillare

Common name Lime-yellow-pea
Plant description Perennial, trailing, taproot

USES		CHARACTERISTICS			
Grazing	+	Nutritive value	+	Resistance to heavy grazing	+
Cut-and-carry	+	Palatability	+	Resistance to pests	+
Hay	+	Productivity	+	and diseases	
Silage	+	Seed production	-	Spreading (by stems	++
Ground cover	+	Ease of establishment	+	and seeds)	
Green manure	+	Adaptation to poor soils	+		
Intercropping	-	Resistance to drought	+		

Vicia vilosa

Common name Hairy-vetch
Plant description Annual, climbing, shallow taproot

USES		CHARACTERISTICS			
Grazing	++	Nutritive value	+	Resistance to heavy grazing	+
Cut-and-carry	++	Palatability	+	Resistance to pests	+
Hay	++	Productivity	++	and diseases	
Silage	++	Seed production	-	Spreading (by seeds)	-
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.