

# Planting grass forages in highland / sub-humid areas

## Why planting grass forage?



Stall feeding of a dairy cow in Eastern Kenya

### 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

Grass forage species provide the bulk of fiber needed by ruminants (the ratio should contain a minimum of 30% of fiber). For non-dairy animals and animals that are not being fattened, grass forage species also cover most of the energy and protein requirement. However, they must be mixed in the ration with concentrates and legumes to provide a balance feed to dairy animals and animals being fattened.

Grass forage can be an important substitute to cereal residues. Their palatability and digestibility is often higher.

Many grass forage species have a powerful root system and may control erosion efficiently when planted along the contour. Many species can be grown on relatively poor soils, where they don't compete with food crops. Grass forage may also be sown along field boundaries and in other farm niches that are otherwise unutilized.

## Few agronomic tips

**Dormancy** - Many grass species are subject to post-harvest dormancy, that is their germination is inhibited by chemical compounds contained in the glumes (the seed envelop). which means germination improves for up to 12 months after harvest, as germination inhibitors in the glumes break down. Careful removal of glumes can accelerate this process, but can damage seed if tackled with excessive vigour.

**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** - Palatability and digestibility of grass forage increase when there are chopped and mixed with forage legumes.

## Avena sativa (Ethiopia)



<b>Common name</b>	Forage oat				
<b>Plant description</b>	Annual				
<b>USES</b>		<b>CHARACTERISTICS</b>			
Grazing	+	Nutritive value	+	Resistance to heavy grazing	-
Cut-and-carry	++	Palatability	+	Resistance to pests and diseases	-
Hay	++	Productivity	+	Spreading	-
Silage	++	Seed production	++		
Erosion control	-	Ease of establishment	++		
Soil rehabilitation	-	Adaptation to poor soils	-		
Intercropping	++	Resistance to drought	-		

## Pennisetum bicolor (Kenya)

**Common name** Forage sorghum

**Plant description** Annual

<b>USES</b>		<b>CHARACTERISTICS</b>			
Grazing	-	Nutritive value	+	Resistance to heavy grazing	-
Cut-and-carry	++	Palatability	+	Resistance to pests and diseases	-
Hay	-	Productivity	++	Spreading	-
Silage	++	Seed production	++		
Erosion control	-	Ease of establishment	++		
Soil rehabilitation	-	Adaptation to poor soils	-		
Intercropping	++	Resistance to drought	+		



## Chloris gayana

**Common name** Rhodes grass

**Plant description** Perennial, tufted

<b>USES</b>		<b>CHARACTERISTICS</b>			
Grazing	++	Nutritive value	++	Resistance to heavy grazing	++
Cut-and-carry	+	Palatability	++	Resistance to pests and diseases	+
Hay	++	Productivity	+	Spreading (by stolons and seeds)	+
Silage	-	Seed production	++		
Erosion control	+	Ease of establishment	++		
Soil rehabilitation	+	Adaptation to poor soils	+		
Intercropping	+	Resistance to drought	+		



## Panicum coloratum

**Common name** Small panicum

**Plant description** Perennial, tufted

<b>USES</b>		<b>CHARACTERISTICS</b>			
Grazing	++	Nutritive value	+	Resistance to heavy grazing	+
Cut-and-carry	+	Palatability	+	Resistance to pests and diseases	+
Hay	+	Productivity	+	Spreading (by seeds)	+
Silage	-	Seed production	-		
Erosion control	+	Ease of establishment	+		
Soil rehabilitation	+	Adaptation to poor soils	+		
Intercropping	+	Resistance to drought	++		



## Pennisetum purpureum

**Common name** Napier grass

**Plant description** Perennial, stolons, bamboo-like

<b>USES</b>		<b>CHARACTERISTICS</b>			
Grazing	-	Nutritive value	++	Resistance to heavy grazing	-
Cut-and-carry	++	Palatability	++	Resistance to pests and diseases	-
Hay	-	Productivity	++	Spreading (by stolons)	-
Silage	++	Seed production	--		
Erosion control	++	Ease of establishment	--		
Soil rehabilitation	-	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.