Forage growing for commercial purpose, hay production

Introduction

Forage production for commercial use is a model for people who are not able or do not want to invest in dairy production, but are looking for a crop which is relatively easy to cultivate and for which a market already exists.

It is also a possibility to start on a small area with small investments to gather experience and gradually expand once the grower is more confident with the production and marketing the product. In Western Kenya, forages are often sold fresh due to the bad reputation of hay, but Brachiaria can be dried well and transformed to high quality hay, making it a storable product that can be sold in times of higher demand and prices, like the dry season.

Case 1

In Western Kenya, young people have started small-scale productions using different Brachiaria (Hybrids and cvs) for commercial hay production. Info on these groups and data is taken from a report commissioned by GfA for the Green Innovation Center (Fodder value chain analysis in Western Kenya: Opportunities for Business development, David Miano Mwangi and Eunice Onyango, 2019)

Table 1: Cost of Production of Bracharia Hay in Western Kenya (Establishment Phase)

Activity/Item	Unit Cost (KES)	Units	Total Cost
1st Ploughing	3,000	1	3,000
2nd Ploughing	3,000	1	3,000
Harrowing	2,500	1	2,500
Seedlings	3	32,000	96,000
DAP (2 x 50 kg bags)	3,500	2	7,000
Planting	300	12	3,600
Weeding	300	12	3,600
Harvesting and baling (Per bale)	70	740	51,800
Labour for transporting to store (Man days)	20	300	6,000
Total			176,500

Table 2: Cost of Production for Brachiaria Hay Production in Western Kenya (Maintenance Phase)

Activity	Unit Cost (KES)	Units	Total Cost
Top dressing (1.5*50 kg bag CAN)	2,200	2	3,300
Labour for applying CAN (Man days)	4	300	1,200
Labour transporting	20	300	6,000
Harvesting	70	740	51,800
Total Cost (KES)			62,300

Mwangi / Onyango use a production of 10.000 kg DM/year that translates to 666 hay bales of 15 kg. The price of Brachiaria hay is given with 400 KES/Bale.

Using this production figure a turnover of 266,400 can be realized.

All the data given for case 1 are calculated per acre, to compare it to other case which are calculated per ha the numbers have to be multiplied by 2,5 which presents

Table 1.1. Cost of establishment of Brachiaria in Western Kenya/ha if bought seedlings are used

Activity/Item	Unit Cost (KES)	Units	Total Cost
1st Ploughing	7,500	1	7,500
2nd Ploughing	7,500	1	7,500
Harrowing	6,250	1	6,250
Seedling cost	3	32,000	96,000
DAP (5 x 50 kg bags)	3,500	5	17,500
Planting	300	36	10,800
Weeding	300	36	10,800
Total			156,350

Establishment costs for Brachiaria plots used over 10 years	15,635 KES/year
Yearly maintenance cost (fertilisation, harvest, transport)	155,750 KES/year
Yearly cost per ha Brachiaria	171,385 KES/year

Table 1.2. Cost of establishment of Brachiaria in Western Kenya /ha if seeds are used

Activity / Item	Unit Cost (KES)	Units	Total cost
1st ploughing	7500	1	7,500
2nd ploughing	7500	1	7,500
Harrowing	6250	1	6,250
Seed costs	5000	8	40,000
DAP (5 x 50 kg)	3500	5	17,500
Seeding	300	12	3,600
Weeding	300	36	10,800
Total			100,350

Establishment costs for Brachiaria plots used over 10 years	10,350 KES/year
Yearly maintenance cost (fertilisation, harvest, transport)	155,750 KES/year
Yearly cost per ha Brachiaria	166,100 KES/year

Establishment costs for Brachiaria plots are about 1/6 of the maintenance costs, it is also a negligible difference between direct establishment by seeds or establishment by seedlings, as establishment costs have to be seen as a cost factor for 10 years. However, the initial investment differs and with seedlings, it is 50% higher.

Table 3: Cost benefit calculation for different Brachiaria from year 2 on (planted with seedlings)

Brachiaria	Prod cost per ha /year	Prod in t DM / ha / year	Value of prod / ha / year (KES)	Income – Prod cost = Profit (KES)
Not specified by Mwangi/Onyango	171,385 KES	25.00 *	400,000	228,615
Mulato 2	171,385 KES	8.00 **	213,000	41,615
Cayman	171,385 KES	23.52 ***	627,200	455,815
Cayman	171,385 KES	10.20 ****	272,000	100,615
Basilisk	171,385 KES	17.84 *****	475,730	304,345

production life of 10 years is base for the calculation (source: CIAT Tropical Forages)

*production data from literature, most possible they are too optimistic, especially when compared to measured production (see below)

**production data from 2 farms in Eldoret

***production data from cutting regime trials on 2 sites in Meru

****production data from 2 farms in Eldoret

*****production data from cutting regime trials on 2 sites in Meru

Value calculated on the base of 15 kg hay bales valued at 400 KES/bale (Mwangi, Onyango, 2019)

Case 2

Table 4: Cost benefit calculation for a professional farm near Eldoret.

Brachiaria	Prod cost per ha /year	Harvested bales / ha / year (Total kg DM)	Value of prod ha / year (KES	Income – prod cost = Profit (KES)
Mixture of Hybrids and cultivars	61,000 KES	2250 (27,000)	2250 x 400 KES = 900,000 KES	839,000 KES
Mixture of Hybrids and cultivars	For production cost given by Mwangi/Onyango			
	171,385 KES	2250	900,000	728,385

The farm has established different Brachiaria hybrids as well as cultivars and does not separate the different materials while harvesting mechanically. Though the number of harvested bales stand for a mixture of improved Brachiaria and not for a certain Hybrid or cultivar.

The number of harvested bales for 2 acres of forages is given with 800 hay bales for the 1st cut and an estimated 1200 hay bales for the 2nd cut. The estimation seems to be too optimistic and was reduced to 1000 hay bales. That translates to a production of 2250 bales /ha.

Hay bale weights do vary a lot and seldom have the standard weight of 15 kg, thus we used a weight of 12 kg for our calculation.

Production costs have been calculated in the cost benefit analysis and represent an average cost calculated on data from 20 farms. Production life of the forage plots is fixed at 10 years.

The production of the forages varies a lot depending on the environmental conditions and the management of the plots, though the better the conditions, the higher the profit possible. The calculated data of Tables 3 and 4 show the possibility to generate an income from haymaking. It also shows that the profit made depends on the (right) choice of forage under the given conditions and the management of the plot, proven by the huge variation of generated profit (41,000 – 839,000 KES / ha/ year respective 728,000 KES/ha/year).

The manager of the professional farm, from which the information was received in an interview is judging forage production (Brachiaria hybrids and CVs, Panicum cvs) as a profitable activity. Consequently, he intends to increase the land under improved forages to 5 acres. Other farms in Eldoret expressed the same intentions. The same development can be registered in Meru, however on a smaller scale due to limited land availability.