Brachiaria Seed Production Business Manual

KCSAP Extension Manual No. 3

FEBRUARY 2023

Kifuko-Koech M.N., Ndungu K.W., Ayako W., Kidula N. L., Namaswa A., Rono S., Ongubo M., Kalama P., Rutto M., Koech S., Nguru J., Mathai N., Chelimo E., Mbugua D., Kemboi S., Geoffrey L., Nyambati E.M. and Wamae D.W.

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DISCLAIMER

The information presented in this publication is for advisory use only. Users should verify specific details to their agro-climatic zones from their area livestock extension officers. Some content in this manual may require expert guidance from extension officers or professionals in animal production.

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Foreword

Kenya Climate-Smart Agriculture Project (KCSAP) tasked the Kenya Agricultural and Livestock Research Organization (KALRO) with the implementation of the project's Component 2 on 'Strengthening Climate-Smart Agricultural Research and Seed Systems'. The component was implemented through several subcomponents that developed, validated, and delivered context specific climate smart agriculture (CSA) technologies, innovation and management practices (TIMPS). Besides delivering on CSA TIMPS, KALRO and her NARS partners have further unpacked the TIMPs through the development of Training of Trainers (ToT) Manuals and Extension Training Manuals for dissemination and upscaling of TIMPs. Through the information and knowledge in the Extension Manuals, farmers will leverage on the TIMPs developed and therefore enhance their productivity.

The contents in the manuals are arranged progressively, supported by extensive information from research and background data. The Manuals design takes into consideration the delivery system, the knowledge, information and its logical flow. Similar content requiring similar delivery systems are grouped together, while the roles of the partners are tapped in the training and planning of the training sessions. The Manuals are arranged into sections, which have a uniform outline that ensures every aspect of the TIMPs are fully covered in way that the users can absorb and relate to. Various delivery methods are deployed and where possible demonstrations and practical work are incorporated to enable the trainees learn by participating in the actual field activities.

Through the sub-component on 'Strengthening Climate Smart Agriculture Research and Seed Systems', the scientists also developed sustainable seed production and distribution systems for priority value chains, to enhance availability and access to improved seeds, animal breeds and fingerlings by target beneficiaries. The scientists have further developed other manuals on specific 'seed' that describe production and management including gross margins of the enterprises of producing the seed material. The information in these manuals is a valuable resource for both public and private sector service providers and farmers. The use of this Brachiaria Seed Production Business Manual is expected to enable the achievement of the envisaged 'Triple Wins' of increased productivity, enhanced resilience and reduction of greenhouse gases emissions.

I am greatly indebted to our scientists and all those who participated in the preparation of this Manual, which is expected to deliver current information and knowledge in a changing agricultural environment.

Eliud K Kireger, PhD, OGW

Director General, KALRO

Preface

The Kenya Climate-Smart Agriculture Project (KCSAP) project development objective (PDO) as outlined in the PAD is "to increase agricultural productivity and build resilience to climate change risks in the targeted smallholder farming and pastoral communities, and in the event of an Eligible Crisis or Emergency, to provide immediate and effective response." This objective is to be achieved through the implementation of five key components, which are 1) Up scaling Climate-Smart Agricultural Practices, 2) Strengthening Climate-Smart Agricultural Research and Seed Systems, 3) Supporting Agro-weather, Market, Climate, and Advisory Services, 4) Project Coordination and Management and 5) Contingency Emergency Response.

Component 2 implemented by KALRO is tasked with the responsibility of providing Technologies Innovations and Management Practices (TIMPS). It supports the development, validation, and adoption of context specific CSA TIMPS to target beneficiaries under Components 1 and 3 as well as development of sustainable seed production and distribution systems.

To catalyze uptake of TIMPs, KALRO in conjunction with partners in the National Agricultural Research Systems (NARS) and Consultative Group for International Agricultural Research (CGIAR) compiled inventories of TIMPs for the prioritized livestock value chains namely; apiculture, indigenous chicken (meat and eggs), dairy (cattle and camel), red meat (cattle, sheep and goats) and aquaculture. Also, there are two (2) cross cutting themes on pastures and fodder, and animal health.

The TIMPs were categorized into those ready for upscaling and those requiring validation. Furthermore, gaps that required further research and development of TIMPS were identified. Training of Trainers' (ToT) manuals focusing on TIMPs that were ready for upscaling for each of the value chains were subsequently developed to form the basis of training county extension staff, service providers and lead farmers. Those trained were in turn expected to cascade the training to beneficiaries in the targeted smallholder farming, agro-pastoral and pastoral communities in the 24 project counties of Marsabit, Isiolo, Tana River, Garissa, Wajir, Mandera, West Pokot, Baringo, Laikipia, Machakos, Nyeri, Tharaka Nithi, Lamu, Taita Taveta, Kajiado, Busia, Siaya, Nyandarua, Bomet, Kericho, Kakamega, Uasin Gishu, Elgeyo Marakwet and Kisumu.

KALRO has been instrumental in using its information resources and those of partners and collaborators to develop information resources that support the upscaling and dissemination of TIMPs. Some of these resources are Manuals, Hand Books, Resource Books, Pamphlets and Brochures whose objective is to unpack the TIMPs information and knowledge for wider usage by the farming community as well as the extension staff.

We are grateful to all who participated in the development and production of this Brachiaria Seed Production Business Manual. It is my hope that users will put this information resource to good use to make the livestock value chain more productive and resilient while minimizing GHG emissions under a changing climate.

Jane Wamuongo, PhD

KCSAP Livestock Coordinator, KALRO

Abbreviations and acronyms

ADF	Acid Detergent Fibre
ADL	Acid Detergent Lignin
C.A.N	Calcium Ammonium Nitrate
CIGs	Common Interest Groups
CP	Crude Protein
DM	Dry Matter
FCRI	Food Crop Research Institute
IVDMD	Invitro Dry Matter Digestibility
KALRO	Kenya Agricultural and Livestock Research Organization
KCSAP	Kenya Climate Smart Agriculture Project
m.a.s.l	Metres Above Sea Level
NDF	Neutral Detergent Fibre
PO	Producer Organization
T.S.P	Triple Super Phosphate
TIMPS	Technology Innovation Management Practices
TVC	Total Variable Costs
VMGs	Vulnerable and Marginalized Group
GMA	Gross Margin Analysis

INTRODUCTION

Urochloa (syn. *Brachiaria*) grass is one of the most important emerging forage crops in Kenya due to its high biomass production and crude protein (CP) content. Improved varieties of Brachiaria have been introduced in Kenya and their adaptability is very good in many parts of the country, especially in highlands, medium altitude and coastal lowlands. The grass is therefore a good alternative to commonly grown pasture grasses like Napier, Guatemala, Seteria, Rhodes grass among others.

Brachiaria grasses have good adaptation to drought, low fertility soils and are environmentally friendly. The grass can withstand dry seasons of 3-6 months and its nutritive value is high. The potential of Brachiaria grass in Kenya to address the challenge of livestock feed shortage has been hindered by seed scarcity, high cost of seed and low seed viability. However, trials by KALRO have proved that root splits can be used as an alternative planting material for production of the forage. The average current price of a split is KES 5. This price may vary based on demand and supply dynamics, location, cost of production among other factors. Gross margin analysis can be used as a guideline for adjusting the price to earn maximum returns. At a spacing of 50 x 20cm, 40,000 splits per acre (100,000 splits per ha) is recommended. Interventions to meet seed demand includes empowering community based seed multipliers, to multiply clean planting materials and improve accessibility to dairy farmers within a given region.

General Agro-ecological requirements for Brachiaria grass production

Brachiaria grass is suitable to tropical and sub-tropical regions of Africa. It tolerates extreme climatic conditions and grows well in low fertile soil. It adapts well in acidic soils with soil pH of between 4 -8. Although the growth rate of brachiaria is reduced in high altitude areas (> 2000 m.a.s.l), it fits well in altitude ranging between 800 to 2000 m.a.s.l. Minimum annual rainfall requirement is 700 mm and less than 5 months extended drought.

Varieties/Cultivars of Brachiaria grass and their attributes

In Kenya, KALRO has released and promoted four varieties which include: *Brachiaria decumbens* cv Basilisk, *Brachiaria brizantha* cvs. Toledo (Xaraes), *B. brizantha* cv Piata, and *B.brizantha cv* MG4 . They grow well in a wide range of agro-ecological zones especially where rainfall is above 700 mm per annum.

i) *Brachiaria decubens* cv Basislisk

Figure 1: Brachiaria decubens cv Basislisk in the field

Urochloa decumbens cv. Basilisk, commonly known as Signal grass was the first improved Urochloa grass cultivar. It is low growing with moderately hairy and soft leaves. It has decumbent or semi-erect growth habit with narrow leaves which arise from stolons. The stolons can develop roots at the nodes. The plant height ranges between 50–120 cm and has green inflorescence. Basilisk has a broad agro-climatic adaptation and can be grown in areas with an average annual rainfall of 700 mm and above, with a dry season of no longer than four months. (Njarui *et al.,* 2021). It grows well in soil of medium to low fertility and tolerates acidic soils. The grass withstand heavy grazing. Its annual production potential is 8-15 t DM/ha (Njarui *et al*., 2021) but the yield is lower in high altitude areas 5-8 tDM/ha/year.

ii) Brachiaria brizantha cv. Xaraes (Toledo)

Figure 2: Brachiaria brizantha cv. Xaraes in the field

Xaraes, also known as Toledo is broad-leafed with semi-erect growth habit. It has an extensive root system which holds the soil firmly, therefore it is good for erosion control. It has a long flowering cycle than Piata, Basilisk and MG-4 cultivars and produce high biomass yield. Toledo is less tolerant to drought than MG-4 and Piata. Although it is stemmy as Piata, it is relatively easier to harvest (Njarui *et al.*, 2021). Toledo thrives well in medium to high fertility soils and altitudes of up to 2300 m above sea level. Its annual production potential is 8-14 t DM/ha (Njarui *et al*., 2021)

iii) *Brachiaria brizantha* cv. MG4

Figure 3: Brachiaria brizantha cv. MG in the field

The cv. MG-4 is narrow leaved and has semi-erect growth habit with plant height ranges of 50–110 cm. The stem, leaf margins and inflorescence are purplish in colour. It has moderately hairy stems and leaves. It is adapted to poor soils. It is easy to harvest and make hay. Its annual production potential is 10-14 t DM/ha (Njarui *et al*., 2021)

iv) *Brachiaria brizantha* cv. Piata

Figure 4: Brachiaria brizantha cv. Piata in the field

The cv. Piata is a broad-leafed grass producing greenish inflorescence. It is stemmy and hard to harvest with a sickle or panga compared to other varieties. It is moderately susceptible to red spider mites. It performs well in altitudes of up to 2,000 m above sea level and medium fertility soil with pH ranging from 4-8. It is drought tolerant but in cold temperatures, growth is reduced. Its annual production potential is 8-13 t DM/ha (Njarui *et al.,* 2021)

Yield and nutritive value of Brachiaria

Brachiaria has a stable biomass production and CP which ranges from 12-16%. The grass matures three (3) to four 4 months after establishment. The chemical composition of Brachiaria varieties harvested at eight weeks interval at KALRO FCRI Kitale is shown in Table 1.

Table 1. Chemical composition (%) of Brachiaria grass varieties harvested at an 8-week interval in Kitale

Cultivar	CP (%)	NDF (%)	ADF %	ADL	IVDMD
Basilisk	14.0	61.4	38.4	3.4	65.8
MG4	12.3	60.6	38.7	3.7	64.0
Piata	13.5	62.1	36.8	3.1	68.3
Xaraes (Toledo)	12.9	62.4	38.7	3.4	63.5
Boma Rhodes	10.0	66.2	42.1	4.0	58.5

Where: CP=Crude protein; NDF=Neutral detergent fibre; ADF=Acid detergent fibre; ADL=Acid detergent lignin; IVDMD=vitro dry matter digestibility

Source: Koech, M.N. *et.al* (2016).

Benefits of Brachiaria

Brachiaria grass is one of the most important forages among others due to its production and adaptability benefits, benefit to livestock, environmental and ecological benefit, and social economic benefits. Some of the key benefits include:

1. High biomass production
2. Well adopted to acidic and low fertility soils
3. Drought tolerant
4. Highly palatable and nutritious

5. Climate smart (reduces nitrogen loss, fixes carbon into the soils, and reduces greenhouse gas emission)
6. Protects the environment (reduces soil erosion)
7. Improves household income (sale of hay and planting material)
8. Potential for new agri-business e.g. sale of hay, silage, feedblocks, seeds and vegetative planting materials (splits/rooted tillers)
9. Improves income and livelihood of livestock farmers
10. Support wildlife as source of feed and habitat

FIELD ESTABLISHMENT AND MANAGEMENT

Land preparation

Land preparation should be well done to ensure that all weeds are eliminated and the soil loosed in readiness for planting (Figure 5). This entails first ploughing followed by first and second harrowing to make a fine tilth. In presence of perennial weeds e.g. couch grass, use of non-selective herbicide is recommended.

Figure 5: Primary and secondary land preparation
(Source: P. Kalama and W. Ayako)

Fertilizer and manure application

Before planting, thoroughly mix soil with well cured manure at a rate of 2 to 4 tonnes per acre. Where the soils are low in phosphorous, apply 100 kg Triple Super Phosphate (TSP) fertilizer per acre. Compound fertilizer (NPK) can be used at rate of 100 kgs per acre.

After establishment, 1.5-2.5 t/acre of well-decomposed manure should be applied every alternate year. The manure is applied between the rows and incorporated into the soil. Manure also helps in moisture retention during the dry season. Alternatively, the grass may be top dressed with 50 kg/acre of Calcium Ammonium Nitrates (CAN) after the first cut, but in subsequent years, 50 kg of CAN is added at the onset of long and short rains.

Propagation

Brachiaria should be planted when there is sufficient rains or throughout the year if under irrigation. Brachiaria can be propagated either from seed (direct seeding or nursery established) or vegetative propagation from root splits (fresh splits or pre-rooted), or stem cuttings. Vegetative propagation can be done on a small scale but may not apply to large scale planting due to the quantity of planting material required.

a) Direct seeding

Direct seeding is convenient for large scale establishment of Brachiaria grass. A seed rate of 5 - 7 kg/ha (2-3 kg/acre) of good quality seed should be targeted. To maximize yield, the seed is drilled by hand or planter in furrows that are 50 cm apart and to a depth of 1 cm. During planting 200-250 kg/ ha of Triple Super Phosphate (TSP) should be applied. Alternatively, well-decomposed manure can be applied at the rate of 5-10 t/ha. The seed is then lightly covered with soil. Germination will take place 5-7 days after planting. (Figure 6).

Figure 6: Brachiaria seed

b) Nursery establishment

The use of rooted splits/ seedling improves the survival rate of the grass and is considered to be the best option for establishing Brachiaria grass. The seed can be planted in a nursery and the seedling transplanted to the main field at 8-10 weeks after emergence.

For nursery establishment, a raised seed bed should be prepared to a fine tilth and furrows of approximately 1cm depth, spaced at 5 cm made. The seed is then drilled evenly to ensure a seed rate of 2.5 to 3.5 kg / ha. After covering lightly with soil, the bed is watered regularly to maintain moisture at field capacity. The bed should be well covered with mulch (dry grass) to prevent scorching and reduce evaporation, which is then removed after seedling emergence.

c) Fresh root splits

Root splits can be obtained from clean well-established, disease and pest-free mother plants. Establishment of Brachiaria takes 3-4 months and initial harvesting of splits should be done from mature well-established stools. An actively growing rooted split with about 2-3 tillers is recommended for planting. Remove a quarter or half of the soil and cover the roots of the remaining stool to encourage further tiller development as shown in Figure 7.

Alternatively to break seed dormancy, the farmer can identify a stool for seed, cut back, and allow the shoots to sprout for 1-2 weeks. When uprooted, the splits will have higher rates of establishment.

At least 40,000 splits per acre or 100,000 splits/ha is recommended at a spacing of 50 X20 cm.

a) Identify mother stool

b) Uproot split from mother stool

c) Loosen the soil using the blunt part of a panga

d) Trim the shoots to (5-10 cm)

e) Split the roots (2-3 stems) to get a standard split for planting

f) Newly planted field

Figure 7: Uprooting, splitting and planting of Brachiaria splits
(Source: Meshack Rutto)

Pre-rooted splits

To fasten sprouting and rooting of the tillers, thereby ensuring uniformity in stand establishment, fresh root splits can be pre-rooted in the nursery for 4 - 6 weeks as shown in Figure 8.

Figure 8: Pre-rooted splits in the nursery

Brachiaria splits inoculation

Inoculation can be done by uprooting Brachiaria grass root stumps, separating the individual splits and incubate in a nursery seedbed with a rooting hormone (HB101® or root doctor ®) to accelerate root formation.

Inoculated splits are placed in a nursery that is covered with a net to prevent direct sunlight. Polythene sheet is placed at a soil depth of 30cm to prevent root penetration deep in the soil. Fill up the gap of 30cm with soil mixed with manure. The sheet also assists in preservation of soil moisture for the benefit of the sprouting seedlings.

Field establishment of Brachiaria splits

The splits are planted at a spacing of 20 cm between plants and 50 cm between rows (100,000 splits/ha i.e 40,000 splits/ acre) by hand or mechanized planter. Planting depth of 0.5 – 1 cm for seed is appropriate. Ensure that the roots are fully covered with soil. The soil around the planted crop is compacted to allow root contact with the soil as illustrated in Figure 9.

Estimation of spacing using thumb and longest finger

Compacting the soil after planting

Planted Brachiaria lines

Figure 9: Planting of the root splits
(Source: Meshack Rutto)

Weed management

Brachiaria seedlings/ root splits are slow to establish, therefore, the grass should be kept free of weeds in the early stages of growth to minimize competition for water, light, and nutrients. After the seedling emergence, weeds can be removed either manually or using selective herbicides to control broad-leaved weeds. First weeding should be done upon weed emergence but care should be taken to avoid damaging the tender and shallow roots of the grass. A clean field is presented in Figure 10.

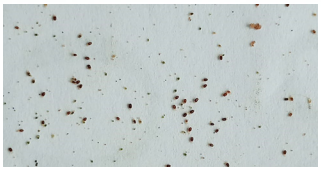
Figure 10: Well-maintained field
(Source: Meshack Rutto)

Pest and disease management

It is important to regularly inspect the Brachiaria fields for any pest occurrence. The most common pests and diseases observed and possible control measures are shown in Table 2 and 3 respectively. Incidence and severity vary between seasons because of environmental and management practices.

Common Pests
The common pests affecting Brachiaria are red spider mites, shoot fly and mole rats (Table 2).

Table 2. Common Pests in Brachiaria grass

Pest	Symptoms and Control measures
   Red spider mites (top left), severe infestation on Brachiaria field (bottom left) and initial symptom of mite infestation on leaves (right)	***Red spider mites*** Infestation is highest during prolonged dry spells **Symptoms** • Plant is yellowish or brownish (scorched) and appear dusty on the underside of its leaves • Mites feed by sucking grass leaf tissue leading to plant withering and eventual drying **Control Measures** • Good agronomic practices • Growing tolerant varieties (MG4, Basilisk, and Toledo/ Xaraes) • Irrigate during dry spell • Timely harvesting of the herbage • In extreme cases, apply recommended miticides

Brachiaria grass with Shoot fly infestation. (Source: Njarui et al., 2020).

Shoot fly

- Attack is observed at early stages of seedling and young tillers

Symptoms

- Wilting, yellowing and drying of the seedlings or tillers of older stand
- Dying of actively growing points

Control measure

- Use clean planting material/treated seed
- Good agricultural practices (Keep the fields weed free).
- In extreme cases, apply recommended systemic insecticides

Mole Rat

Mole Rats

- Mole rats burrow through the soil and feed on the roots and leaves
- Signs of their damage and presence include; small mounds of freshly dug soil, dry Brachiaria plants, stems and leaves being pulled down into the soil holes
- For effective control of the moles, farmers should combine forces to collectively manage the moles through physical trapping and chemical poisoning e.g. Fuko-kil®

Diseases

The most common diseases of Brachiaria grass reported in Kenya includes leaf rust, leaf spot, leaf blight, honeydew or ergot and smuts (Table 3). Among them leaf rust, leaf spot and leaf blight are widespread in Kenya. A recent study has shown difference among the Brachiaria cultivars against leaf rust, leaf spot and leaf blight diseases. The prevalence of ergot and smut diseases in the country is low.

Table 3. Common diseases in Brachiaria grass

Pest	Symptoms and Control measures
 *Symptoms of rust on Brachiaria leaves*	***Rust*** • Caused by fungus **Symptoms** • Brown spots and lesions (severe cases) on leaves **Control Measures** • Good agronomic practices • Growing tolerant varieties. • Timely cutting before the leaves age • Irrigate during the dry period. • Use of tolerant variety (Basilisk and MG4)
 *Symptoms of leaf spots in Brachiaria grass*	***Leaf spots*** • Caused by bacteria **Symptoms** • Brown spots and streaks on blades or sheath **Control measure** • Good agronomic practices (clean planting materials, weeding, fertilization and harvesting at the right time) • Grow tolerant varieties.

<table>
<tr>
<td> 
Smut disease of Brachiaria grass (Source: Patrick Kalama and Meshack Rutto)</td>
<td>Smut
Honeydew/Ergot diseases caused by fungus
Symptoms
• Sticky honeydew oozes from infected florets for Ergot diseases
• Florets have black powder for smut disease
Control Measures
• Good agronomic practices (clean planting materials, weeding, fertilization and harvesting at the right time)
• Grow tolerant varieties.
• Spray with recommended insecticides and fungicides at flowering</td>
</tr>
<tr>
<td> 
Leaf blight</td>
<td>Leaf blight
Caused by fungus
Symptom
• brown spots and streaks on leaf blades
Control measure
Good agronomic practices (clean planting material, weeding, fertilization and harvesting at the right time)</td>
</tr>
</table>

SEED BUSINESS ANALYSIS

Gross Margin analysis of Brachiaria Split (Basic costs/Estimated returns)

This is a simple and reliable tool to assess the financial performance of an activity. It helps to make an informed decision on enterprises. Gross margin analysis can be used as a guideline for adjusting the price to earn maximum returns (Table 4). All records on agricultural inputs, labor and operation costs and yields should be well kept to assist the farmer in making decisions on the seed enterprise.

Table 4.Gross margin analysis of Brachiaria seed (split) for two years

Description	Unit	2021 Quantity	2021 Cost (KES)	2021 Total (KES)	2022 Quantity	2022 Cost (KES)	2022 Total (KES)
Inputs							
Purchase Brachiaria root splits	No.	40,000	3	120000			0
T.S.P/N.P.K Fertilizer	bags	2.5	6000	15000			0
Top dress Fertilizer - CAN	bags	2.5	5300	13250	4	5300	21200
Manure purchase	tons	2	1000	2000	4	1000	4000
Pre-emergence herbicide purchase	Ltr	1	1300	1300	1	1300	1300
Insecticide	Ltr	4	2000	8000	4	2000	8000
Sub-total A				**159,550**			**34,500.**
Operation costs							
Ploughing	acre	2	3000	6000			0
Harrowing	acre	1	3500	3500			0
Furrowing	acre	1	1800	1800			0
Spliting making labour	Man Days	40	350	14000	50	350	17500
Transport cost of splits	lumpsum	1	3000	3000			0
Rooting harmone	pcs	20	80	1600			
Labour planting	Man Days	15	350	5250			0

Chemical application	Man Days	10	350	3500	10	350	3500
Fertilizer application labour	Man Days	10	350	3500	10	350	3500
Manure handling/transport/ application	Lumpsum	1	6000	6000	1	6000	6000
Weeding 3 times	Man Days	57	350	19950	29	350	10150
Packaging material	pkts	50	100	5000	70	100	7000
Uprooting splits	Man Days	20	350	7000	30	300	9000
Sub-total (B)				**80,100**			**39,150**
Total Variable Cost				**239,650**			**91,150**
Sale of root splits (Harvest 1)	No.	100,000	4	400,000	100,000	3	250,000
Sale of root splits (Harvest 2)	No.				120,000	3	300,000
Total splits sold for 2 years							**320000**
Total revenue (TR) for 2 years							**950000**
Total variable cost of production (TVC) for 2 years							**330,800**
Gross Margins (GM= TR-TVC)							**619,200.00**
Gross margin % (GM/TR*100)							**187.18**
Total Variable Cost of production per split (KES)							**1.03**

Using Gross Margin to determine the sale price of Brachiaria seed (split)

To determine the sale price the farmer should consider demand and supply dynamics, location, cost of production among other factors. Prices can be determined by first assessing the unit cost of production.

Unit Cost of Production = Cost of Production per Acre Yield/ production per Acre

Gross margin analysis (Table 4) shows that during the first year, the cost of producing one acre of Brachiaria splits is higher (KES 239, 650) due to higher operational cost. However, this cost is reduced drastically in the second (KES 91,150) and subsequent years. This therefore means that the price of selling one brachiaria split will be higher initially but after establishment of Brachiaria price is likely to be lower depending on the demand and supply of the split.

Gross margin analysis for 2 consecutive years shows that when the farmer sells the split at KES 3-4, a return of approximately KES 619,200 is expected in 2 years. However, with the cost of producing one acre of Brachiaria splits with an expected yield of 320,000 splits and cost of KES 330,800, the cost of producing 1 split is KES 1.03. Therefore, a seed farmer can sell the split at a cost higher than KES 1.03 to make a profit.

The % gross profit margin for both years (187%) was greater than the threshold of 20%. The % gross profit margin indicates how efficiently a farmer is using resources to produce the seed. High gross profit margin will show that a farmer is making money on the seed enterprise while a low margin will indicate that the sale price is not much higher than the cost. Generally, for a good business, the threshold gross profit margin should be above 20%.

Brachiaria split business model

Brachiaria grass is a fairly new technology to majority of farmers. One way of promoting uptake is to empower community based organizations and farmers to produce splits and avail to other farmers. The farmer needs to ensure that supply of clean planting material and demand for the farm produced splits is created in a sustainable manner. One model to ensure sustainability of the seed production enterprise is by use of a distribution/ marketing model that encourages diffusion of the Brachiaria split to reach the target farmers. Under the KCSAP seed project, a three-Tier system of seed production was used. The first Tier involves production at research level (e.g in KALRO) which avails seed to satellite seed multipliers referred to as Tier 2. This comprises mainly community based seed producers e.g POs, CIGs, VMGs and lead farmers. Tier 2 is very critical for mass seed production and meeting

of the seed demand due to the proximity to other farmers who are referred to as Tier 3. Tier 2 therefore become a source of clean planting materials to Tier 3 and should be trained on all the aspects of Brachiaria to be able to market the outputs as shown in Figure 11.

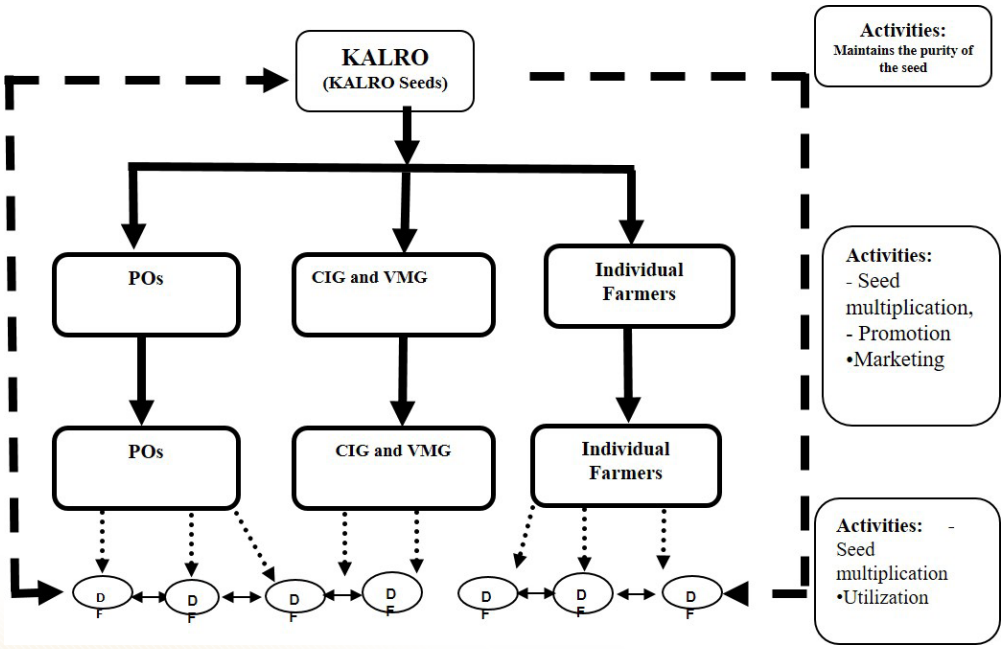


Figure 11: ***Brachiaria Seed Business model***

Where: PO- Producer organization; CIG – Common interest group; VMG – Vulnerable and marginalized groups, DF – dairy farmers

Creating demand for Brachiaria Seed (split)

For successful marketing of Brachiaria split, farmers and farmer groups need to focus on some basic marketing principles which include product, price, place and promotion. This helps farmers decide on the product and its characteristics, set the price, and decide how to distribute and promote it. This is based on the following marketing principles;

- Product: what to produce? Brachiaria split. New products being introduced into the market such as Brachiaria will require consumers (farmers) to be sensitized through training to enable them to influence other customers and therefore create demand. The potential customers have to be convinced that the product will be of value to them and suitable for their needs as animal feed.

- Price: at what price to sell? The price of producing 1 split is Ksh 1.03 which is determined mainly by the cost of production and demand. However, demand has to be created. Once consumers are convinced, the producers can supply the product through negotiated price putting in to consideration the production costs of the split.

- Place: where to sell it? Farmers can sell the rooted splits amongst themselves, other CIGs, VMGs, POs and other institutions. As demand is created the producers have to ensure adequate supply to satisfy the created demand.

- Promotion: how to promote the product? This can be achieved using avenues such as farmer to farmer interactions, churches, schools, shows, milk collection centers and use of printed materials. In addition, promotional campaigns in farmer to farmer extension, field days, and agricultural shows, through demonstration, County extension staff and social media plat forms are among other avenues that farmers can use to market their seed.

Further Readings

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