



Project title	Development of competitive and Sustainable Forage Seed Systems for Dairy Farming Stakeholders in Kenya -Naivasha		
Annual Report	Year 1- October 2020-September 2021		
KCSAP livestock Adaptive- 2019/SS/02	Forage Seed Systems	Duration: 18 Months	Start Date: Oct 2020
Lead Institution	KALRO		
Principal Investigator	William Ayako email: willyayako@gmail.com		
Other investigators	Josephat Mulindo: RELO Kakamega county Julius Martim: RELO Bomet and Kericho counties		
Collaborators	County Directors of Livestock in the KCSAP counties of Nyeri, Kakamega, Bomet and Kericho KCSAP – CPC in the respective counties Forage producer organizations in the respective counties		

Background

Kenya has an estimated livestock population which comprise of 17.5 million cattle, 27.4 million goats, 17 million sheep and 2.97 million camels. Livestock plays an important role in Kenya's economic development, contributing 40% of the agricultural GDP and 10 % of the total GDP. Livestock production depends majorly on rainfall which has a direct influence on forage production. Forage availability is determined greatly by seasonality. Under tropical environmental conditions, pasture and fodder crops production and conservation are the backbone of the livestock sub sector and are valuable tool in meeting the changing feed and energy requirements of livestock operations throughout the year.

Kenya has a well-established seed company, Kenya Seed Company (KSC) which produces seed grown by contracting farmers and also imports forage legume seeds, mainly from Australia, which are needed by Kenyan farmers. The Kenya Government is charged with the responsibility of producing breeder's seed through its research institutions and supplying it to seed companies, including KSC. The Kenya Plant Health Inspectorate Services (KEPHIS) is responsible for seed inspection and ensuring that the seed quality is controlled to international standards.

Kenya Agricultural and Livestock Research Organization (KALRO) has the mandate to produce both pasture seed and vegetative materials for on-farm research and for distribution to farmers.

There are several factors which should be put in place by the various actors involved in the development of the forage seed industry in Kenya. These include the need for research institutions and other stakeholders to: (a) produce basic and breeders seed and maintenance of distinctness, uniformity and stability (DUS) of forage seed; (b) increased number of forage seed varieties; (c) develop a seed certification and seed law enforcement programme by KEPHIS; (d) develop seed cleaning, processing and packaging technology; (e) a better knowledge of seed quality.

Research and development work on pasture seeds in Kenya are concentrated in areas where the pasture species are best adapted. In such areas, higher seed yields are obtained and the varieties are less likely to undergo genetic drift caused by different environmental stresses such as temperature, soil type, rainfall regime and altitude. It is against this back drop that this work has been developed

to support the forage seed industry through establishment, availing and upscaling climate smart forage seed technologies, innovation and management practices for the livestock sub-sector.

Objectives

- (i) To produce and maintain improved (Napier grass, Sweet Lupins and dual-purpose sorghum-Ikinyaruka) forage seed varieties.
- (ii) To strengthen forage seed production systems among the dairy CIGs, Producer organizations and Youth groups.
- (iii) To develop and strengthen alternative delivery systems for improved forage seeds.

Expected Outputs

1. Improved and clean forage seed/planting materials produced and maintained.
2. Competitive forage seed system developed and sustained in the target KCSAP counties of Kericho, Nyeri, Bomet and Kakamega.
3. Improved forage seed systems strengthened among dairy CIGs, POs and youth groups.
4. Alternative forage seed/planting materials delivery systems developed and strengthened.

I ACHIEVEMENTS

Objective 1: To produce and maintain improved (Napier grass, Sweet Lupins and Dual purpose Sorghum-Ikinyaruka) forage seed varieties

Activity 1.1: Development of models for forage germplasm multiplication, management and conservation

Achievement:

The following forages were established at KALRO – Dairy Research Institute Naivasha

- Napier grass- 3.5 acres Napier grass
- Dual-purpose forage sorghum (Ikinyaruka) – 0.5 acres
- Sweet Lupins (*Lupinus angustifolius* - 28137) – 0.5 acres
- Bitter Lupins (*Lupinus albas* – Kieve mutant) – 0.5 acres
- Brachiaria (CVs Basilisk, MG4, Xareas, Piata) -1 acre

Napier grass and Brachiaria have matured and ready for distribution.

Objective 2.1: To strengthen forage seed production systems among the dairy CIGs, Producer organizations and Youth groups

Activity 2.1 Forage seed produced for target counties

Achievement:

The following forage seed were produced and processed for sale and distribution to CIGs, POs, VMGs in the KCSAP counties of Kericho, Nyeri, Kakamega and Bomet (Table 1)

Table 1: Forage seed produced and processed for target counties

Forage type	Quantity produced and processed
Dual purpose Sorghum seed produced	2,340 kg
Bitter Lupins	100 kg
Sweet Lupins	100 kg
Napier grass	900,000 cane cuttings
Brachiaria	300,000 splits

Objective 2.1: Improved forage seed systems strengthened among dairy CIGs, POs and youth groups

Activity 2.1 Trained POs, CIGs and VMGs on forage seed systems

Achievement:

Trained POs, CIGs and VMGs from Nyeri County

Table 2: Number participants' trained from Nyeri County

County	Sub county	Ward	Name and category (POs, CIG, VMG)	Amount of seed/planting materials	Remarks
Nyeri	Kieni East	Thegu	Lusoi farmers' Co-operative (800 members - 30 active (16M, 14F)) (PO)	1.Napier – 7800 cuttings 2.Sorghum – 2kg 3.Brachiaria – 3600 splits	5 members trained
Nyeri	Kieni	Thegu	Kamuhuria Self-Help group (VMG – 20 members (7M, 13F)	1.Napier grass-5600 cuttings 2.Brachiaria – 3600 splits	5 members trained
Nyeri	Kieni East	Gakawa	1.Kieninyitia Self-Help group (CIG)	1. Napier grass – 1000 cuttings 2.Sorghum 5 kg 3.Lupins 2 kg 4.Brachiaria 1000 splits	5 members trained
Nyeri	Kieni East	Gakawa	2.Gakawa dairy Co-operative (PO - 20 (13M, 7F))	1.Brachiaria - 900 splits 2.Napier grass – 1000 cuttings 3.Sorghum – 5 kg 4.Lupins – 5 kg	5 members trained
Nyeri	Kieni East	Gakawa	3. Gatuanyaga Dairy Co-	1.Napier grass – 1000 cuttings	5 members trained

			operative (PO - 24 (10M, 14F))	2.Sorghum – 5 kgs 3.Brachiaria – 1500 splits	
Nyeri	Kieni East		4. Githima Self-Help group (VMG - 22 (7M, 15F))	1.Napier grass – 1000 cuttings 2.Sorghum – 2.5 kgs 3.Brachiaria – 1500 splits	5 members trained

Stakeholders' meeting and stage setting

- 1 stakeholder planning meeting was held in Nyeri County
- 30 forage seed producers identified in Nyeri county, Kieni Sub-County as outlined in 7.2 above.

II Constraints and how they were overcome

- The project implementation was delayed by GoK- Covid 19 containment measures
- Delayed procurement of fencing materials
- Delayed forage seed multiplication and distribution

III Summary of funds received, accounted for and balance

In total, 1,528,000 shillings was disbursed to cater for the implementation of the planned activities. 1,368,000 shillings was spent to implement the activities as indicated below:

Project Amount (KES)	Amount Received (KES)	Amount accounted for (KES)	Balance (KES)
Agricultural inputs (seed and fertilizer, Fencing material)	295,000.00	256,000.00	39,000.00
Hire of machinery (Diesel and lubricants)	300,000.00	90,000.00	210,000.00
Agricultural chemicals	75,000.00	10,000.00	65,000.00
Casual labor	858,000.00	824,000.00	34,000
DSA	0	188,000.00	188,000.00
Total	1,528,000.00	1,368,000.00	160,000.00

IV Way Forward

- To continue with the forage seed multiplication at KALRO-Dairy Research Institute Naivasha
- To continue with selection and training of forage seed producers in the counties of Kericho, Bomet and Kakamega
- To conduct forage seed trainers' workshop to develop seed training manuals

- To conduct stakeholders' meeting to identify sites and recruit forage seed producers
- To distribute planting materials in Kericho, Bomet and Kakamega
- To surrender expenditure of first quarter and request for second quarter disbursements

Total project funding (KES)	Amount Disbursed (KES)		Variance (+/-)
8,960,100.00	1,528,000.00		7,432,100.00
Amount disbursed by activity (KES)	Amount Disbursed (KES)	Expenditure (KES)	Variance (+/-) (KES)
1.Agricultural inputs (seed and fertilizer, Fencing material)	295,000.00	256,000.00	39,000.00 (+)
2.Hire of machinery (Diesel and lubricants)	300,000.00	90,000.00	210,000.00 (+)
3. Agricultural chemicals	75,000.00	10,000.00	65,000.00 (+)
4.Casual labor	858,000.00	824,000.00	34,000 (+)
5. DSA	0	188,000.00	188,000.00 (-)
Total	1,528,000.00	1,368,000.00 (89.5%)	160,000.00 (+)

9.0 Constraints encountered

The following constraints were encountered during the year:

5. Implemented activities

The following activities were implemented at the Dairy Research Institute, Naivasha:

2.0 Development of models for forage germplasm multiplication, management and conservation

2.1 Bulking of Napier grass, sweet lupin and dual-purpose sorghum and exotic forage germ plasm

2.2 Fencing of forage seed bulking plots

The following forages have been established at KALRO – Dairy Research Institute Naivasha

1. Napier grass -3.5 acres Napier grass
 2. Dual purpose forage sorghum (Ikinyaruka) – 0.5 acres
 3. Sweet Lupins (*Lupinus angustifolius* - 28137) – 0.5 acres
 4. Bitter Lupins (*Lupinus albas* – Kieve mutant) – 0.5 acres
 5. Brachiaria (CVs Basilisk, MG4, Xareas, Piata) -1 acre
- Napier grass and Brachiaria have matured and ready for distribution.

6. Milestones achieved

The following forage seed were produced and processed for sale and distribution to CIGs,POs, VMGs in the KCSAP counties of Kericho, Nyeri, Kakamega and Bomet

Forage type	Quantity produced and processed
Dual purpose Sorghum seed produced	2,340 kg
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Sweet Lupins	100 kg
Napier grass	900,000 cane cuttings
Brachiaria	300,000 splits

7. Forage seed distribution and sale to KCSAP

7.1 Recruitment and training of CIGs, VMGs and POs

County, Sub County and Wards	No. of POs, CIGs, VMGs	Amount of seed/planting materials distributed
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County, Kieni East sub county, Gakawa ward		CIGs -1 VMGs- 2 POs- 3	1.Napier grass-7,400 cuttings 2.Sorghum-24.5 kg 3.Lupin-5 4.Brachiaria-12,100 splits		
7.2 Number of recruited and trained participants from various POs, CIGs and VMGs					
County	Sub county	Ward	Name and category (POs, CIG, VMG)	Amount of seed/planting materials	Remarks
Nyeri	Kieni East	Thegu	Lusoi farmers’ Co-operative (800 members - 30 active (16M, 14F)) (PO)	1.Napier – 7800 cuttings 2.Sorghum – 2kg 3.Brachiaria – 3600 splits	5 members trained
Nyeri	Kieni	Thegu	Kamuhuria Self-Help group (VMG – 20 members (7M, 13F)	1.Napier grass-5600 cuttings 2.Brachiaria – 3600 splits	5 members trained
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Nyeri	Kieni East		4. Githima Self-Help group (VMG - 22 (7M, 15F))	1.Napier grass – 1000 cuttings	5 members trained

				2.Sorghum – 2.5 kgs 3.Brachiaria – 1500 splits	
7.3. Stakeholders’ meeting and stage setting					
1 stakeholder planning meeting was held in Nyeri county					
30 forage seed producers identified in Nyeri county, Kieni sub county as outlined in 7.2 above					
8.0 Summary of the project funding and expenditure					
In total, 1,528,000 shillings was disbursed to carter for the implementation of the planned activities. 1,368,000 shillings was spent to implement the activities as indicated below:					
Total project funding (KES)			Amount Disbursed (KES)	Variance (+/-)	
8,960,100.00			1,528,000.00	7,432,100.00	
Amount disbursed by activity (KES)		Amount Disbursed (KES)	Expenditure (KES)	Variance (+/-) (KES)	
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3. Agricultural chemicals		75,000.00	10,000.00	65,000.00 (+)	
4.Casual labor		858,000.00	824,000.00	34,000 (+)	
5. DSA		0	188,000.00	188,000.00 (-)	
Total		1,528,000.00	1,368,000.00 (89.5%)	160,000.00 (+)	
9.0 Constraints encountered					
The following constraints were encountered during the year:					
<ul style="list-style-type: none">• The project implementation was delayed by GoK- covid 19 containment measures• Delayed procurement of fencing materials• Delayed forage seed multiplication and distribution					
10.0 Way forward					
<ul style="list-style-type: none">• To continue with the forage seed multiplication at KALRO-Dairy Research Institute Naivasha• To continue with selection and training of forage seed producers in the counties of Kericho, Bomet and Kakamega• To conduct forage seed trainers’ workshop to develop seed training manuals• To conduct stakeholders’ meeting to identify sites and recruit forage seed producers• To distribute planting materials in Kericho, Bomet and Kakamega• To surrender expenditure of first quarter funds and request for second quarter disbursements					