



Report on forage seed system in Zambia

Noah N. Sikaceya and Solomon Mwenda

March 2023

INTRODUCTION

The most important constraints to improving livestock production in Zambia are related to animal nutrition (Kulich, 1987).

In Zambia has about 20.3 million hectares of rangeland (Ministry of Fisheries and Livestock, 2020). Cattle contribute at least 61% of the meat and 95% milk consumed in the country. In view of the above, the livestock sector has tremendous potential and capacity in contributing to poverty alleviation, increasing the socio-economic status of most people and, consequently, contributing significantly to the economic growth of the country (Daka,2007)

The need for increased productivity and food security in the country has stimulated a lot of interest in the quest to provide improved nutrition to livestock in order to increase productivity. One area which has drawn a lot of attention is the need to improve the countries natural pastoral grazing lands and adoption and cultivation of superior forage/fodder species.

In the initial stages of development of the seed industry in Zambia, the Zambia Agricultural Research institute (ZARI) began the pasture and fodder industry which provided the pasture seeds for government run farms. ZARI provided most of the seeds to the then commercial farms and this led to the start of the pasture industry in Zambia. The Seed Control and Certification Institute (SCCI) was running forage breeding programmes, especially through the Zambia Seed Company (Zamseed). Owing to lack of appreciation of the importance of forage production and pasture development by the majority of small-scale livestock farmers in the country, very few smallholder farmers attached monetary value to growing of forage grasses and legumes as a source of livestock feed. The main challenges faced by the forage seed subsector during the past two decades are summarized as follows:

- i) Low market demand for forage seed, especially for legumes, following market liberalization in the 1990s, during which period most private seed companies found it uneconomical to invest in forage seed production and marketing;
- ii) Lack of expertise and skills in forage, worsened by 'brain-drain' of forage specialists.
- iii) Research in seed was reduced to varieties of field crops and research work on forage crops had stalled.

There are five identified seed systems predominant in Zambia, which include 1) farmer-saved, 2) NGOs and cooperatives, 3) Public-Private, supported by ZARI and local seed companies, 4) Private, supported by international seed companies, and 5) Private, supported by out-grower schemes for export commodities. In the informal farmer-saved system, farmers themselves multiply and exchange seed locally, both through barter and sometimes for cash. This system has no quality assurance measures for the landraces that are multiplied. In the second system, NGOs are assisting community groups or farmer cooperatives in seed multiplication and marketing. Smallholder farmers in Zambia who grow crops other than maize are nearly always acquiring seed through these two systems.

This report seeks to identify and gather more information regarding the current players in the forage seed systems in Zambia as well as some of the various aspect associated with the forage seed industry in the country.

BACKGROUND

With the current rising demand for forage seed, a few private companies are involved in forage seed production and marketing, such as Klein Karoo (K2), Hygrotech, Advanta and Afriseeds. However, the seed for most forage species (particularly perennial legumes) is scarce and when available, it is expensive and therefore not affordable for most smallholder farmers.

According to the Baseline study/survey on the seed sector of Zambia (Miti, 2015), the seed provision in Zambia is guided by the Plant Variety and Seeds Act (CAP 236). The Act provides for the Seed Control and Certification Institute SCCI, under the Ministry of Agriculture (MoA), to enforce the Act. SCCI is also the administrator of the Plant Breeder's Rights Act (no. 18 of 2007) which aims at promoting development of new plant varieties. The duties of SCCI are implemented through its main activities, including:

- (a) Variety testing, registration and protection,
- (b) Seed systems and inspections,
- (c) Laboratory seed-testing.
- (d) Audits and monitoring private laboratories that are licensed to test and certify seeds for the local market.

SCCI also trains and examines candidate inspectors, samplers and analysts. Successful candidates are licensed to perform respective seed quality control activities. Like any other authorized seed grower, forage seed growers will be required to register with SCCI, either through an authorized seed company or a legitimate Seed Growers' Association. The seed crops are subjected to field standards which include rotation, isolation and off types and successful seed crops are harvested.

METHODOLOGY

The data collected to document this study of the forage seed systems in Zambia was mainly through phone calls, online research and one-on-one discussions with various stakeholders. The impact of COVID 19 and its associated movement restrictions did however negatively affect the ability to freely collect data. We do however believe that this report gives a pragmatic overview of the current forage system situation in the country.

TYPES OF SEED SYSTEMS AND ROLES OF SEED INDUSTRY ACTORS

The seed industry in Zambia includes the active participation by both the private and public sectors in seed quality control and a licensing scheme. Seed systems can be either formal or informal (local seed systems). Formal systems generally consist of public sector research institutions, such as ZARI, public and private sector agencies producing and marketing seed, and organizations responsible for seed certification and quantity control (for example the SCCI).

a) The formal sector seed supply system in Zambia operates along two models:

- i. Public Sector model (Variety Testing and Research): Researchers improve and develop breeders seed through a public research institution to multiply on research stations or through contract seed-growers. All activities, including seed cleaning, processing, quality control and marketing are conducted by government-supported research and or donor funded research grants and development organizations like the Golden Valley Agricultural Research Trust (GART).

- ii. Private sector model: Private seed companies, to which smallholder farmers are linked, play an important role in seed multiplication and marketing. Researchers (public sector) provide breeder seed (released varieties) to private seed companies to be multiplied into parent and commercial seed (certified seed). Forage seed production, processing and marketing is done by private companies and/or farmer cooperatives.

ACTIVE FORAGE SEED COMPANIES

There are six major companies that are currently either producing, distributing or both. Here is an outline of each of these companies, their contacts and what types of forage seeds they are handling. Some of the information may not be conclusive as we respect the right of reservation to information as each company's policy dictates.

It would be important to note that some small scale farmers dotted around the country were also trained in forage seed production through a project entitled Enhanced Small Livestock Investment Programme (E-SLIP).

Table 1.0 seed companies and their phone contacts

S/n	Seed Source	Contact (+260)
1	Klein Karoo	977762111 / 975732172
2	Agriserve	960349577 / 969767272
3	Hygrotech	977 545 534
4	Afriseed	211 847 735 / 950 847735
5	Advanta	977324688
6	Livestock Services	211254024

1. AGRISERVE

The company has seen an interest in *Brachiaria* and Rhodes grass from farmers. Their clients are mostly commercial farmers who buy in large volumes with a small percentage being smallholder farmers. The high interest from farmers was observed in 2019 but this did not translate into sales. However, in the year 2020, the company saw an increase in sales. Among the notable varieties that Agriserve sales include;

1. *Brachiaria* Marandu
2. *Brachiaria* Piata
3. *Brachiaria ruziziensis*
4. *Panicum* Mombaca
5. *Panicum* Zuri

Agriserve has branches in Lusaka and Chisamba

2. KLEIN KAROO

Klein Karoo in Zambia was established in 2011 and is one of the biggest companies supplying pasture seeds to farmers. They have a very strong demonstration Centre in Chisamba which has been a pioneer of demonstrating pasture production to smallholder farmers. A number of organisations and individual farmers have been trained at their demonstration Centre in Chisamba. Among the notable pasture varieties the company sales include;

1. Rhodes grass
2. *Panicum Maximum*
3. White Buffalo
4. Blue Buffalo cv Molopo
5. Blue Buffalo cv Gayanda
6. Kikuyu
7. Love weeping grass
8. Velvet beans
9. Sunnhemp
10. Sugar graze
11. Pigeon pea
12. Cowpea
13. Dolichos lablab
14. Nutrifeed
15. Lucerne

Klein karoo has branches in Chisamaba and Lusaka (Makeni and Mungwi road) supplying seed to both commercial and small scale farmers across the country.

3. HYGROTECH

More information is yet to be collected from this company. However, the varieties mentioned Hygrotech market include:

1. Kikuyu grass
2. *Panicum maximum*
3. *Stylosanthes scabra cv seca*
4. *Stylosanthes hamata V8*
5. Lucerne
6. Red clover
7. Forage sorghum (cow candy, sugar graze)

4. AFRISEED

Afriseed is a company that has been trading cereals and legumes for human consumption. In the recent past the company has incorporated the production of forage legumes as a protein source to address the dry season challenges that farmers face in Zambia. The main clients who buy seeds from the company are smallholder and medium scale farmers. The company is reporting increased seed sales due to increased interest from emerging farmers. Currently the company is reporting demand to outstripped supply. Among the legumes being sold include;

1. Dolichos lablab
2. Velvet beans
3. Cowpea

Due to the increased demand for forage legumes, the company has focused on capacity building their staff in pasture production of both legumes and grasses. The company has focused their effort establishing demonstration plot of different pastures and legumes as a way of building the pasture section. Among the pastures the company is focused on include;

1. Rhodes grass
2. Siratro
3. Desmodium
4. Stylosanthes
5. Bana grass

5. ADVANTA

Advanta Seed has been supplying and selling seeds through Klein Karoo over the past 5 years but the company intends to start selling the forage sorghums as Advanta Seed. The seeds that are being traded include;

1. Nutrifeed
2. Sugargraze

6. LIVESTOCK SERVICES

Livestock Services Cooperative Society is a nonprofit making organization which was established by the Zambian farming community in 1991. Its aim is to become the leading Livestock & Agricultural Cooperative in Africa through the provision of quality products at the most competitive prices. This organization is the largest retailer and wholesaler of Livestock products in the country. They stock various seed dependent on the market demand and seed availability (Table 3).

7. ESLIP FORAGE SEED GROWERS

The Ministry of Fisheries through the Enhanced Smallholder Livestock Investment programme trained 55 farmers in seed production principles. The 55 seed growers are smallholder farmers who are located in 22 districts across 9 provinces. The seed growers were trained on a contract-based buyback system. The Objective of training the 55 seed growers was to;

1. Make forage seeds **available** to smallholder farmers across the country
2. Make the forage seeds **Accessible** to smallholder farmers across the country
3. Make forage seeds **affordable** to smallholder farmers across the country

The contract buy back system has been implemented over 3 seasons so far and the production has seen an increase in production from one season to another. This concept has led to the creation of 55 rural fodder seed banks. The 55 seed growers are broken down as 35 males and 20 females and 1 youths.

At institutional level, 2 livestock breeding centers namely Chipompo in Northern province and Mukulaikwa in Central province produced forage seeds.

Table 2. current fodder seed market prices

AVERAGE MARKET PRICES FOR PASTURE SEEDS			
S/N	ITEM	PACKAGE SIZE(Kg)	PRICE(Zmw)/Package
GRASSES			
1	Kikuyu	1	2000
2	Brachiaria	5	2000
3	Panicum Maximum	5	1800
4	Rhodes Grass	5	1500
5	weeping love grass	1	180
6	Teff Grass	1	60
7	Blue Buffalo	1	350
LEGUMES			
1	Velvet Beans	1	42
2	Lablab	1	85
3	Pigeon Pea	1	42
4	Cowpea	1	42
5	Lucerne	5	2,300
6	Stylosanthes	5	2,200
FORAGE SORGHUMS			
1	Nutrifeed	1	300
2	Sugargraze	1	160

Table 3. Estimated forage seed imports

Company	Seed - country of origin	Seed varieties	Estimated imported tonnage per 6 months
Klein karoo	South Africa	Rhodes grass	30
	South Africa	<i>Panicum maximum</i> cv mombasa	30
	South Africa	Lucerne - aurora, South Africa standard	15
	South Africa	Lablab - rongai, highworth	30
	South Africa	Clover - red and white	10
	South Africa	Forage sorghum - sugar graze	5
Hygrotech	Tanzania	Kikuyu grass	20
	Tanzania	<i>Panicum maximum</i> cv mombasa	20
	Australia	<i>Stylosanthes scabra</i> cv seca	15
	Australia	<i>Stylosathes hamata</i> cv v8	15
	South Africa	Lucerne- South Africa standard	5
	America	Turf	5

	South Africa	Clover- red	5
		Forage sorghum -kow candy, sugar graze	
Afriseed	Zambia	Sunhemp	90
	Zambia	Velvet beans	150
	Zambia	Lablab	60
	Zambia	Cowpeas	60
	Zambia	Jack beans	90
Livestock services	Brazil	<i>Panicum maximum</i> cv mombasa	30
	South africa	Rhodes grass cv katombora	15
	Brazil	<i>Brachiaria</i> cv marandu, zuri, ruziensis	90
	America	Turf	20
	Tanzania	Kikuyu grass	30
		Lucerne – South Africa standard	10
Agriserve agro	Brazil	<i>Panicum maximum</i> cv mombasa	60
	Brazil	<i>Brachiaria</i> cv marandu, zuri	60
	Brazil	<i>Brachiaria</i> cv piata, ruziensis,	60
	South Africa	Rhodes grass cv katombora	15
		Informal seed suppliers	
			Per year
Sable farms	Zambia	Rhodes grass	300
Commercial farms	Zambia	Sunnhemp	300

NB: the above figures are based on estimates obtained from the sales staff of these various entities with the exception of Sable Farms from chisamba. Sable Farms has 850 Ha of Rhodes Grass for seed. They supply the majority of the Rhodes grass to other livestock farmers across the country through a network of commercial farmers and brokers.

DISCUSSION

From our study, it was obvious that the majority of livestock farmers (majority being small scale) do not have readily access to quality forage seed and neither do they have sufficient knowledge on the establishment of improved pastures. The seed and the agronomical and economical information that move in tandem were available only for the minority commercial sector. The challenges facing the forage seed system in Zambia can be looked at from four main levels; Production, Distribution, seed regulation and adoption.

a. Production

- No national forage seed breeding institution functional to establish the most ideal forage species for specific areas
- Inadequate knowledge on forage establishment (farmers and extension officers)
- Poor irrigation infrastructure as a back up to impacts of climate change
- Low accessibility to quality seed

b. Regulation

- Insufficient knowledge from seed control authorities on the modalities regarding determining the quality of forage seed. The focus has been food crop seeds so there is need for sensitisation
- Due to the above point, the process of importing quality seed is very rigorous and often very time consuming.
- Informal seed sale is the norm and as such the quality of the seed is not certain and this often leads to poor performance of the forages.

c. Distribution

- Most of the seed suppliers are retail outfits situated along the railway line as such, rural livestock farmers do not have access to the few seed suppliers in the country
- High cost of packaging equipment and material often compromises the packaging which reduces the seed viability by the time of planting.

d. Adoption

- Many farmers utilise local grass (such as *Hyparrhenia rufa*) for dry season feeding despite the low nutritional quality of the hay.
- High cost of certified seed makes it unaffordable to many farmers

OPPORTUNITIES

The opportunities for development and scaling up of the forage seed system in Zambia are numerous some of these are listed below:

- Increasing demand for forage seed. There is a huge demand for forage seed and this is evident by the inability of the seed suppliers to meet local market demand especially for the grasses (Rhodes grass, Brachiaria and Panicum maximum) and increasingly for the legumes as well

- Zambia currently has one of the best milk prices in the region (USD 0.50 – 0.60/ Lt). This price has made farmers realise that sustaining milk production throughout the year is more profitable than most other farming ventures. As such there is more willingness for uptake of pasture improvement.
- The Government has made deliberate policy to ensure that the livestock sector is highly prioritised. One example is the creation of a directorate office for rangeland and pasture development at the Ministry of Livestock and Fisheries.
- Cattle disease control efforts are seeing livestock numbers increasing and as such creating demand for improved rangelands.
- The climate in Zambia is ideal for the establishment of most tropical forages.
- The geographical position of Zambia is strategic as a forage seed producing hub that can supply the sub-Saharan region and beyond.

CONCLUSION

We can deduce from this study that the forage seed system in the country is still in its infancy. there is need for the formal sector to play a much bigger role in the development of the sector so as to meet the growing demand for forage seed. There is also a need to have a holistic forage/fodder training component in extension staff curriculum in order to have a stronger knowledge base concerning cultivated forage. The need to strengthen research in selection and breeding of relevant forage species and upgrading existing research centers is imperative to reduce the knowledge gap.

integrating forage seed in the Farmers Input Support programme (Government subsidized agro support program). By so doing, a clear data base of forage seed consumers would be established for easy monitoring of seed quality and forage crop performance. Specifically, designated agro-dealers and community groups would be used to ensure that forage seed reaches the end-users at the correct time. Rural shops, Groceries, 'Tumtembas' and Veterinary Drug retail outlets are promising channels for disseminating information about availability of forage seed to customers. This would greatly improve the distribution channels and ensure that the most ideal forage species are distributed specific to the area within and outside Zambia.

ACKNOWLEDGEMENTS

We would like to express our gratitude to all the seed companies and farmers that shared valuable information without which, this study would not have been possible.

REFERENCES

Kulich. J (1987) the potential of pasture legumes and their roles in improving farming practices under extensive livestock production systems in Zambia. Presentation at the proceedings of the third workshop of the African Forage plant genetic resources, evaluation of forage germplasm and extensive livestock production systems

Ministry of Fisheries and Livestock (2020), National Livestock development policy

Zambia Early generation seed study (2007) country report

Daka D.E (2016) Livestock sector in Zambia; opportunities and limitations

Miti. F (2015) Baseline study/survey on the seed sector of Zambia