The forage seed systems in Uganda

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Introduction

The dairy production sector plays a crucial role in promoting food and income security in Uganda (Kabunga, 2014). However, one of the major technical constraints affecting dairy production is low quality and quantities of forage and feed (Kabirizi, 2006). In order to enhance availability of adequate and superior quality feed resources for dairy cattle production, National Livestock Resource Research Institute (NaLIRRI) and Makerere University have executed basic and adaptive research. Accordingly, high yielding and drought tolerant forages including *lablab purpureus*, *setaria sphacelata* and *Brachiaria mulato* have been introduced to improve animal nutrition as well as overcome forage scarcity. Other improved forages include; Chloris, panicum, lablab, mucuna, siratro, centrocema and fodder trees like calliandra, leucaena, gliricidia (Mugerwa *et al.*, 2012).

The Uganda seed subsector is characterized by co-existing formal and informal systems (MAAIF, 2018). In the Informal sector, seeds are produced without any certified regulations and this includes farmer-saved seeds, farmer-farmer seed exchange and farmer managed seed production. In order to transition into the formal seed system, Quality declared seed (QDS) which is produced by trained group of farmers or individuals was introduced by the government. The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) together with integrated seed sector Development (ISSD) program have put an effort to produce a draft of QDS regulations which will ensure that the quality seeds are registered with MAAIF through District Agricultural Officer (DAO).

The formal seed sector in contrast is comprised of established and formally recognized state and commercial institutions engaged in seed research, development and distribution. The National seed Certification Services (NSCS) through MAAIF is responsible for the design, establishment and enforcement of certification standards, methods and procedures. The seed and plant act and regulation of 2006, was created to provide for the promotion, regulation and control of plant breeding and variety release, multiplication, conditioning, marketing, importing, exporting, quality assurance and certification of seed and other planting material. In cases the seed is to be imported, it has to be accompanied by minimum certification standards on International Seed testing Association (ISTA) or domestic certifications and a phytosanitary certificate as provided in the plant protection Act.

This report focuses on the current state of the forage seed system in Uganda under the formal sector and seeks to provide useful information to private and public stakeholders and development actors likely to engage in tropical forage seeds sector of Uganda.

Methodology

Information on forage seed production and supply by formal seed companies in Uganda was gathered through a scoping visit. This was carried out through a face to face interview with the help of a checklist with the companies' head offices as shown in *Table 1*. Informal seed sector was not covered.

Table 1: Summary of the location and contacts of forage seed companies.

Seed company	Location of head offices	Coordinates	Contact	Email
Simlaw Seeds	Sixth street , Kampala	0°19'01''N, 32°36'16''E	0782323334	simlaw@simlawseeds.com
East Africa Seeds (U) Ltd	Kampala district, Kawempe Sub county	0°21'32''N, 32°33'43''E	0772583783	reddy@easeed.com/ info.ug@easeed.com
Rhino Seeds Africa Ltd	Kampala district, Kawempe county, Kiyindi village	0°21'30''N, 32°33'44''E	0702363165	info@rhinoseeds.net
National Forestry Authority (National Tree seed Centre)	Wakiso district, Kiira county, Kazinga village	0°21'27''N, 32°40'53''E	0781519433	mwodim@gmail.com
NARO Holdings Ltd	Wakiso district, Kyadondo North county, Nakyesasa village	0°30'59''N, 32°38'16''E	0778737611	muwanika.chris@gmail.com
ROBRAN Holdings Ltd	Wakiso district, Kyadondo North county, Kabanyoro village	0°27'54''N, 32°36'43''E	0789491350	briannatwi@gmail.com

Findings

The need for improved animal nutrition has encouraged some companies to venture in the still growing forage seed and vegetative split business in Uganda. All the companies in *table 1* have been in the business for over 4 years apart from rhino seeds which just joined 2 years back.

Most of these companies like NARO holding, Robran holdings and Rhino seeds produce, process and package the seeds while Simlaw seeds, East African seeds and partly Robran holdings import seeds from countries like Kenya. The companies which produce seed also contract farmers who they offer training in seed agronomy practices, quality assurance seed, marketing, and field and post harvest management. *Table 2* shows different forage seed varieties produced and supplied by each company with grasses being the main and fodder trees the least.

Table 2: Type of forage species sold supplied by each company

Company	**Type of organization**	**Forage seed**
Simlaw Seeds Company	Private	Boma rhodes, sugar graze, nutrifeed, desmosium, lucern
East Africa Seeds (U) Ltd	private	Lucern
Rhino Seeds Africa Ltd	Private	Maize, sorghurm, Rhodes grass, napier grass, desmodium, cow peas, pigeon peas
National Forestry Authority	Government	Calliandra, Sesbania, Leucaena (trichandra)
NARO Holdings Ltd	Private	Rhodes grass . Desmodium, Lucern, Lablab, Napier grass, Branchiaria, Centrosema, Siratro
ROBRAN Holdings Ltd	Private	Branchiaria, Rhodes grass, Foxtail, kikuyu grass, guinea grass, napier grass, desmodium, lablab, alfalfa, centrocema, mucuna, Calliandra, Sesbania, Leucaena, Gliricidia

The breeding of forage species is carried out by National Agricultural Research Organization (NARO) which is the sole supply of the foundation seed used in production.

The major customers of the seeds are Individual farmers, government institutions like Operation Wealth Creation (OWC), NGOs like FAO, farmer groups, dairy cooperatives and Ag/vet stockists. The selling price ranges for the different forage seeds are represented in *table 3* below.

Table 3: Suppliers of forage species against prices in 2019

Fodder seed stocked	Variety	Suppliers /stcokist	Retail price/ kg	Wholesale price
Boma Rhodes	*Chloris gayana*	Simlaw	45000	40,000
Sorghurm (Sugar graze)	*Sorghurm bicolor L.*	Simlaw	30,000	20,000
Nutrifeed	*Pennisetum glaucum*	Simlaw	40,000	30,000
Maize	*Zea mays*	Rhino seeds	2300	
Sorghurm	*Sorghurm bicolor*	Rhino seeds	2300	
Foxtail	*Cenchrus ciliaris*	Robran holdings	45000-50,000	
Branchiaria (Mulato, Ruziziensis, brizantha)	*Brizantha, ruziziensis Mulato*	NARO Holdings, Robran holdings	30,000-35,000	35,000
Guinea grass	*Panicum maximum*	Rhino seeds, Robran holdings	30,000	30,000
Kikuyu grass	*Pennisetum clandestinum*	Robran holdings	40,000	40,000
Napier grass/ elephant grass	*Pennisetum purpureum*	Rhino seeds, Robran holdings, NARO holding	25,000-50,000	
Rhodes grass	*Chloris gayana*	NARO holdings, Robran holdings	30,000-35000	35000
Desmodium (green and silver leaf)	*Desmodium uncinatum*	Robran Holdings, NARO holdings, Simlaw seeds	150,000	160,000-180,000
Lucern (Alfalfa)	*Medicago sativa*	NARO holdings, Simlaw seeds, Robran holdings	57000-120,000	
Lablab	*Lablab purpureus*	NARO holdings, Robran holdings	40,000	40,000
Cowpeas	*Vigna unguiculata*	Rhino seeds	4000	
Pigeon peas	*Cajanus cajan*	Rhino seeds	5800	
Centro	*Centrosema pubescens*	NARO holdings, Robran holdings	30,000-40,000	40,000
Siratro	*Macroptilium atropurpureum*	NARO holding	30,000	
Mucuna /Velvet beans	*Mucuna pruriens*	Robran holdings	40,000	40,000
Calliandra	*Calliandra calothyrsus*	NFA, Robran holdings	90,000-140,000	130,000
Gliricidia	*Gliricidia sepium*	Robran holdings	50,000	40,000
Sesbania	*Sesbania grandiflora*	NFA, Robran holdings	50,000-60,000	
Leucaena	*Leucaena leucocephala*	NFA, Robran holdings	50,000-80,000	

In order to ensure quality seeds, the seeds are certified by MAAIF which considers aspects like seed purity, moisture content and germination capacity and field aspects like isolation distance, plant health, and purity are considered in certification of the production process. The seed companies face several challenges as shown in *table 4* which many hinder efficient production or supply.

Table 4: Challenges faced in different activities during seed production, processing and supply

Obtaining foundation seed	**Production**
• High prices • Lack of germplasm • Limited available quantities • Lengthy period of obtaining seed	• Seasonal changes • High labor demands • High cost of production • Limited land • Lack of financial resources • Lack of skilled labor • Low and unreliable demand • Pests and diseases
Processing and packaging	**Marketing**
• Lack of appropriate machines like for cleaning and drying • High labour intensity • Expensive packaging material • Lack of enough storage.	• High competition from the informal seed producers. • Poor infrastructure eg roads • Low and unreliable demand

Table 5: Trends in demand for the different forage seed varieties

Variety	Increasing	static	decreasing	Reason
Branchiaria brizantha	+			Increased awareness and demand
Branchiaria ruziziensis			+	Low awareness
Branchiaria Mulato	+			Increased awareness and quality
Chloris gayana	+			Increased awareness and quality
Cenchrus ciliaris		+		Increased awareness and
Kikuyu grass		+		Increased awareness
Panicum maximum			+	Low quality
Napier grass	+			Increased quality, demand and marketing
Silver leaf Desmodium	+			Increased awareness
Green leaf Desmodium	+			Increased awareness
Lablab	+			Increased awareness
Alfalfa	+			Increased awareness
Centrocema			+	Improved quality, Increased awareness and marketing
Mucuna	+			Increased marketing
Calliandra	+			Increased marketing
Gliricidia	+			Increased awareness and marketing
Leucaena	+			Increased demand and marketing
Sesbania	+			Increased demand and marketing
Maize	+			Increased demand and marketing
Sorghurm		+		Low demand and increased competition from the breweries industry
Cowpeas	+			Increased marketing
pigeion peas		+		Low demand
Rhodes			+	Low demand
Sugar Graze	+			Increased marketing
Nutrifeed			+	Low marketing
Siratro		+		Low marketing

Discussion

The formal seed sector is important in distributing quality certified seed in Uganda. From the current trends shown in *table 5*, the demand for forage seeds can be predicted to increase in the coming years mainly because of the efforts by the government to create awareness of improved forage seed varieties in order to improve animal nutrition. However, the abundant availability of grazing land discharges farmers from investing in the use of these improved forages.

There is also limited awareness about the different available varieties of forage seeds amongst farmers and other actors due to the low input of the private sector. As a result, some of the farmers still use food crops like maize and sorghum as forage which are equally demanded by food companies.

There are few varieties of forage seeds in Uganda due to the poor breeding program at NARO which is the sole source of foundation seed that only focuses on improving a few already existing varieties.

The Formal companies are not very competitive against the informal seed producers who have a direct link with farmers and sell seeds at a lower price. The high prices set by the individual formal companies are due to absence of a platform that would otherwise control the pricing and marketing of forage seeds in Uganda.

The introduction of quality declared seed by MAAIF with support from ISSD which offers training to farmers on the production of quality seeds further widens the market for the informal sector. The demand for seeds sold by the formal sector is also lowered by the free seeds provided by the private and government organizations in support of the livestock sector which causes over dependence by the farmers.

There are no clear criteria for seed importation into Uganda and the different varieties imported depend on the customers' demands. This is because of the companies fear making loses due to the unreliability of the forage seed demands. The varieties sold by some international companies like Simlaw and East Africa seeds also depend on the stock available at their head quarters in Kenya where the seeds are produced.

The forage seeds quality assurance is undertaken by the National Seed Certification Service Division (NSCS) under the department of crop Inspection and certification in MAAIF. However its emphasis is mainly on the field crops and as a result, there is little information on the registered forage seed varieties in Uganda.

Conclusion

The private sector has a potential; big role to play in support of the forage seed business in Uganda. However, we only have a few companies trading ion forage businesses. Most of the forage seed is traded through informal channel e.g. farmers, farmer groups, CBOs, Dairy farmer associations etc. There is need to strengthen private sector involvement in forage seed distribution. This will enable easy access by farmers to improve forage seed and contribute to improved forage production and use in the country.

REFERENCE

Kabirizi, J. M. (2006). Effect of integrating forage legumes in smallholder dairy farming systems on feed availability and animal performance. *Unpublished Ph.D thesis, Makerere University, Uganda*.

Kabunga, N. S. (2014). Improved dairy cows in Uganda: *pathways to poverty alleviation and improved child nutrition* (Vol. 1328). International Food Policy Research Institute.

MAAIF (Ministry of Agriculture, Animal Industry and Fisheries). (2018). National Seed Policy. Entebbe Uganda.

Mugerwa. S., Kabirizi, J. M., Njarui., & Mpairwe, D. (2012). Utilization of introduced forages by smallholder dairy farmers in Uganda. *International Journal of Biosciences, 2(1),* 36-45.