



Quality Declared Seed Class for Farmer Groups

Complying with Seed Quality Standards in Northern Uganda

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"In the past, quality in seed production was something we expected from outsiders. For us as farmers, we produce the seed and someone else brings quality. However, after ISSD trainings, we realised that we are responsible for the seed quality ourselves. 'Ogwali acele balo wangi pii' (Just one frog can contaminate the whole water point). Therefore, we are very critical on the seeds that the members bring." This is a quote from a **member of Obanga Ber farmer group Local Seed Business (LSB) in Lira.**

Background

The use of good quality seed and planting materials of high yielding varieties significantly increases yields by 15-20% (Ambika et al., 2014) in crop production. It is essential that quality seed is available, accessible and affordable for farmers so these benefits can

be realised. In Uganda, farmers access quality seed through two co-existing seed systems. The formal system, which is regulated by government, contributes about 15% of total seed supply. The remaining 85% of seed is produced through the informal system that is unregulated and depends on farm-saved seed from previous harvests.

The Seeds and Plant Act 2006 defines five seed classes including pre-basic, basic, certified (I & II), and standard seed. The draft National Seed Policy 2014 adds quality declared seed (QDS) as the sixth and newest class of seed to be implemented under the Act. Unlike certified seed, QDS requires minimum field inspections and certification standards for seed purity and germination. In essence, the Act has been implemented to reduce seed production costs without compromising quality and is designed to help provide access to quality seed for farmers not served by formal seed systems. QDS certification meets small-holder farmers' needs and is a basis for future certified seed market development. QDS is

designed to complement the traditional seed planting inspection and certification system.

To promote QDS, the Integrated Seed Sector Development (ISSD) programme in Uganda has organised and empowered market-oriented farmer groups into Local Seed Businesses (LSBs). Currently, 30 LSBs with approximately 900 farmers are operating in Northern, South Western and West Nile regions of Uganda. LSBs produce and market QDS of mainly food and nutritional security crops within their communities, and in areas where certified seed from seed companies is not readily available. In season 2015A, LSBs sold over 1,000 tons of various QDS seed (Table 1).

Table 1: Quantity of QDS sold by LSBs in 2015A

Seed	Quantity sold (kg)
Beans	146,539
Cassava	760,620
Groundnut	3,071
Finger millet	938
Potato	13,900
Rice (upland)	38,053
Sesame	21,155
Soybean	5,056
Pasture	500

QDS produced by LSBs was tested at the national seed laboratory in Kawanda and the seed met the minimum national standards of variety purity and germination.

Benefits of QDS

QDS provides a proximate, affordable and trustworthy source of quality seed to farming communities, which promotes use of quality seed among farming communities and raises household incomes. QDS also increases smallholder farmers' demand for quality seed so as to boost crop productivity and ensure food security.

In addition, farmers producing QDS are benefiting financially from the sales of QDS every season. In other LSBs, every seed grower is tasked with producing a minimum of 2 acres of QDS as their production strategy. In that way, every member has a chance to financially benefit from the harvest and sale of QDS.

In Aye Medo Ngeca, an LSB in Amwoma sub-county, Dokolo district, the members included adult men and women, youth and widows. The benefits from QDS sales are well recognised among all these different member categories. The more one invests in seed production, the more he/she can earn after sales.

Through the quality assurance system, skilled and enterprising farmers involved in informal seed systems have the opportunity to graduate into the formal system by expanding their capacities for production of quality seed, establishing a brand name, and marketing their seed.

The LSBs producing and marketing QDS earn significant revenue from quality seed sales. LSBs members have better livelihoods as they are able to improve their housing and nutritional standards and are easily paying school fees for their children.

The flow diagram on the next page shows the sequence of events in quality assurance activities for QDS production and marketing that has been elaborated in this brief.

Steps involved in producing QDS

Production of QDS goes through defined and regulated guidelines to ensure quality is not compromised in the production and marketing of LSB seed. As production activities are undertaken by the farmers themselves, QDS production is regulated by government

Figure 2: Flow chart of quality assurance activities in QDS production and marketing



through the Department of Crop Inspection and Certification (DCIC), and the Ministry of Agriculture Animal Industry and Fisheries (MAAIF). Below are the sequence of activities which result in production of QDS and the regulations involved.

1 Acquisition of authentic foundation seed from agricultural research centres

Seed production requires that a seed grower plants authentic high quality seed called foundation seed, usually obtained from a research institution. Foundation seed, which is

also referred to as basic seed, is a seed class produced from breeder seed. Breeder seed is the highest class of seed produced and is maintained by the breeder. Foundation seed is produced by or under the supervision of the breeder to ensure that genetic purity of the variety is maintained. In Uganda, agricultural research is a public function run by the government under the National Agricultural Research Organisations (NARO). NARO is mandated to produce and market foundation seed to seed growers.

LSBs apply for foundation seed a season in advance to ensure that breeders produce only the quantity which is demanded. Close to the onset of the rainy (planting) season, LSBs then purchase the required quantities of foundation seed. Although this is the ideal situation in acquiring foundation seed, farmers still have difficulties in making advance bookings of foundation seed, as well as paying for the quantities booked. It is common practice that farmers find it easy to purchase foundation seed in the desired quantities without advance booking. When purchasing foundation, LSBs are provided with a certificate of acquisition by the breeder. This certificate is to confirm the authenticity of the seed source bought by the LSBs.

2 Submission of 'planting returns' to MAAIF/authorised district agricultural officer (DAO)

When LSBs complete the planting of their seed fields, the details of the individual fields planted are recorded in a specific format referred to as 'planting return'. Planting return is recorded by members of the production committee for each LSB upon verification that the field planted has germinated well. Planting return provides the authorised DAO with clear information about the area planted with seed, field locations and the date of

planting by each LSB member. The planting return also provides LSBs with the expected QDS quantity that may be harvested from the different seed fields. Completed records are then submitted to the authorised DAO who is to conduct field inspections and the DAO is paid an authorised fee. Field inspections are services which are paid for by the seed grower. Currently LSBs in Amolatar, Apac, Dokolo, Gulu, Kitgum, Kole, Lira, Nwoya, Otuke, and Pader are paying a standard fee of UGX 50,000/- per inspection to the DAOs. According to QDS guidelines, there should be a minimum of two inspections. But LSBs in northern Uganda are willing to pay for more than two inspections. This approach has impressed the various chief administrative officers from northern Uganda districts. "Farmers are known for demanding free things. For many years, government have been procuring and delivering seed and farming equipment for free to farmers. However, this LSB approach is very unique to me. Now a farmer demands for a service and pays for it. This will make lobbying support from government easier as farmers are already on the forefront," said Mr. Mwange, deputy CAO Dokolo District.

3 Field inspections for quality control at production level

The key component of QDS production is self-driven quality control and assurance by the LSB members and leadership. To ensure quality seed is produced under QDS class, there are specific criteria that must be followed. For the seed grower, following these prescribed quality adherence procedures is referred to as **quality control**. Whereas, the process of verifying if a seed grower has followed the recommended guidelines is referred to as **quality assurance**. Quality assurance starts from the source of the foundation seed, through to production, treatment and packaging. At production levels, field

inspections are very important in ensuring that seed growers observe the recommended quality standards. Field inspections are systematic procedures to ascertain and verify variety purity and conformity to set standards in seed production. The two types of field inspections conducted during QDS production are internal and external field inspections.

1 Internal field inspections: These are conducted by LSBs themselves, led by an internal quality control committee (IQCC). As a strategy to ensure quality seed is produced, LSBs elect a three member committee who are tasked with the responsibility of quality control during QDS production and marketing. The IQCC are trained by an ISSD seed expert and MAAIF inspectors. The trainings mainly ensure that the IQCC learn how to collect quality control data and also conduct field inspections. Other IQCC roles include: assessing LSB foundation seed demand before the production season and timely ordering; and coordinating the purchase and delivery of foundation seed from authorised providers and institutions such as NARO. The internal field inspection ensures that all LSB seed fields are inspected prior to any external inspections.

Internal inspections allow corrective measures to be taken by LSB members during the seed production period. During this inspection, the IQCC confirms the isolation distance, planting practice to ensure row planting and optimum plant populations, and the non-existence of off-types, weeds, pests and disease incidences. Isolation distance is the minimum allowable distance between two fields planted with crops of the same type. This is done to avoid varietal contaminations through either cross pollination or physical mixture. Off-types are undesired crops or varieties appearing in the seed fields that are

removed through a process called rouging. Rouging is carried out a minimum of three times before QDS is harvested to maintain the variety purity of the seed under production. The LSB IQCC conduct a minimum of four inspections before QDS harvest is done.

To motivate the members of the internal quality assurance committee in doing their work, LSBs in northern Uganda have proposed a small motivation fee of UGX 500/- for every field visited by the committee. The money is paid to the internal quality assurance committee after the inspection process. The committee records the receipt of the fund and can use it to provide water to the internal field inspectors. The reason for paying this fee after inspection is to rule out bias during the inspection process.



Mrs. Rose Duca, member of Aye Medo Ngeca LSB in Dokolo district conducting rouging in her sesame field, second season 2014

2 External field inspections: This is also called quality assurance. External inspection is a systematic process of verifying whether the procedures undertaken by the seed growers meets the set minimum standards. Principally, external field inspections are carried out by authorised technical persons called 'field inspectors'. ISSD Uganda, in partnership with MAAIF, trained selected DAOs to conduct QDS inspections at district level on behalf of the MAAIF National Seed Certification Services (NSCS). In the northern zone, the DAOs from Amolatar, Apac, Dokolo, Gulu, Kitgum, Kole, Lira, Otuke and Pader were trained under this arrangement in response to the limited number of NSCS inspectors to provide the demanded field inspection services to seed growers. The training covered a number of topics including: regulatory services and the

role of central and local government in agricultural input quality assurance; QDS principles and standards; laboratory seed testing and analysis; seed production systems; and field inspection principles and procedures. After the training, the DAOs are accredited to conduct inspections.

After receiving LSB planting returns in their district, the DAO then plans to inspect the fields twice. During the inspection, the DAO samples 10% of the total fields under seed production by each LSB. The first inspection is recommended during the flowering period of the crop while the second inspection is conducted just before the seed field is harvested. The inspection results in either approval of the seed fields which met minimum standards, or rejection of those which did not.

Table 2: Details of fields visited to some farmers

No	Farmer's name	LSB group	Variety	Planting date	Previous crop in field	Stage of crop	
1	Opio Saverti	Tic Ryemo Can	5R	8/4/2016	Rice	Past 50% flowering	
		Tic Ryemo Can	14R	15/4/2016	Rice	1st flower appear	
2	Ojok F. Otunu	Tic Ryemo Can	5R	8/4/2016	Rice	Past 50% flowering	
		Tic Ryemo Can	14R	15/4/2016	Virgin land	Beginning to flower	
3	Ojok Walter	Tic Ryemo Can	6T	08/4/2016	Sunflower	50% anthesis	
		Tic Ryemo Can	5R	08/4/2016	Rice	1st flower appear	
4	Farm management	Ngetta ZARDI	Serenut 5-14 +SGV0074	02/5/2016	Cereals	2 weeks old	

To cover the costs of external inspection, LSBs agreed a flat fee of UGX 50,000/- to be paid by the LSBs to the delegated DAO carrying out the inspection.

QDS is harvested and processed

When the seed fields reach maturity, the IQCC conducts the last field inspection to confirm the crop maturity and variety and also recommend any necessary rouging. The crops are then harvested without delay to reduce any postharvest losses which involves threshing, cleaning and drying. The LSB members then bulk the harvest in a central seed store. At the bulking point, the moisture content of every seed delivered is confirmed by the use of a moisture meter as only well dried seed is allowed into the bulking stores. For those members

with seed not well dried, they are advised to carry out further drying before the seeds can be accepted.



Seed lot under germination tests at Kawanda Seed Lab, 2015A

Crop hygiene		Uniformity	Problems mentioned by farmers	General remarks
Bands needs expansion during 2nd weeding		Uniform	Gaps/poor stand due to guinea fowls	<ul style="list-style-type: none"> •Row planted crop •True to type with less than 1% off types seen -rouging to be done
Late 1st weeding		Uniform	Gaps/poor stand due to guinea fowls	<ul style="list-style-type: none"> •Row planted crop •True to type •Band clearing needed to control rodents and other pests
Delayed 1st weeding		Uniform	Gaps/poor stand due to guinea fowls	<ul style="list-style-type: none"> •Row planted crop •True to type •Band clearing needed to control rodents and other pests
Bands needs expansion during 2nd weeding		Uniform	Delayed land preparation by tractor	<ul style="list-style-type: none"> •Row planted crop •True to type •Band clearing needed to control rodents and other pests
Weedy		Uniform	<ul style="list-style-type: none"> •Delayed land tractor opening •Wilting •Stem rot •White grub 	<ul style="list-style-type: none"> •Row planted crop •True to type
Weedy		Uniform	Delayed land tractor opening	<ul style="list-style-type: none"> •Row planted crop •True to type
Weedy		Uniform stand	Flooding, no labels	<ul style="list-style-type: none"> •Row planted •True to type

Sampling QDS for laboratory tests

LSBs apply for seed sampling and laboratory testing every season following bulking. The seed samples are taken by the authorised seed sampler from the National Seed Laboratory at Kawanda or from Ngetta ZARDI seed laboratory. Up until the end of 2015, seed sampling was done by Kawanda lab since Ngetta lab was still under restoration. As soon as the lab is in operation, LSBs

in northern Uganda will find it easier to have their seeds tested in this laboratory due to its proximity. LSBs pay for seed sampling and testing at a cost UGX 50,000/- per LSB per season.

QDS produced in 2014A passed the minimum standards tests carried out by the national seed lab, as seen in summaries of the test results in table 3 below;

Table 3: Summary of LSB's seed tests results from the National Seed Lab for 2014A

LSB name	Crop	Variety	Purity (%)	Germination (%)
Wot Anyim	Soybean		99	88
Agik Dak	Rice	Nerica 4	99.5	96
Agik Dak	Rice	Nerica 4	99.4	93
Agik Dak	Simsim	Sesame 2	98	92
Agik Dak	Rice	Nerica 4	99.4	93
Latyeng	Rice	Nerica 4	99.5	98
Jing Komi	Rice	Nerica 4	99.4	93
Jing Komi	Rice	Nerica 4	99.4	93
Jing Komi	Pigeon peas	CO554	99.8	90
Jing Komi	Simsim	Sesame 3	99	81
Jing Komi	Simsim	Sesame 2	98.9	85
Jing Komi	Simsim	Sesame 2	98.9	82
Aye Medo Ngeca	Groundnut	Serenut 5	NA	80
Aye Medo Ngeca	Simsim	Sesame 2	98.9	82
Tic Ryemo Can	Groundnut	Serenut 5	NA	92
Tic Ryemo Can	Groundnut	Serenut 7	NA	83
Tic Ryemo Can	Groundnut	Serenut 8	NA	82
Tic Ryemo Can	Simsim	Sesame 2	98.9	82
AFOSEN	Simsim	Sesame 2	98.8	84

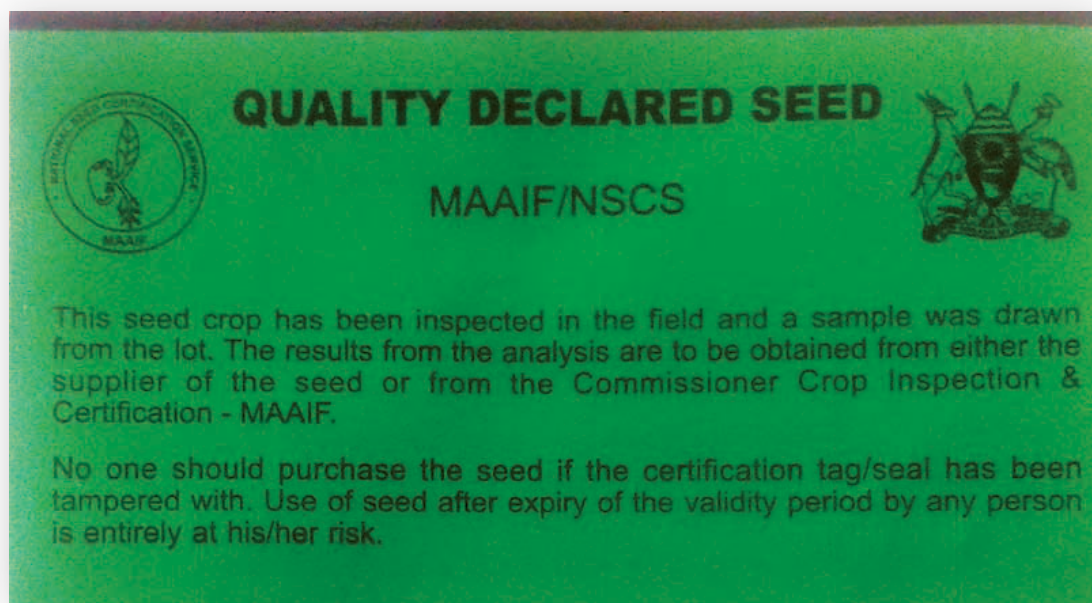
LSB seeds tested at the National Seed Laboratory at Kawanda passed the minimum quality standards for QDS set by MAAIF, hence complying with the QDS standards.



Seed lot under germination tests at Kawanda Seed Lab, 2015A

Table 4: Laboratory seed testing standards for QDS, NSCS

Species	Minimum purity (%)	Minimum germination (%)	Maximum moisture content (%)
Cereals			
Finger millet	98	70	13
Pearl millet	98	70	13
Sorghum	98	70	13
Pulses			
Beans	98	70	10
Chickpeas	98	70	10
Cowpeas	98	75	10
Oilseed crops			
Sesame	98	70	10
Groundnut	98	70	13
Soybean	98	65-70	11



QDS certification label issued by MAAIF to LSBs

The seed laboratory issues certificates to LSBs

Seed samples submitted for laboratory tests are issued with certificate, which indicates whether the seed has met minimum standards or not. Only varieties which have passed minimum standards are recommended to be marketed by LSBs.

QDS certification labels

LSBs use the laboratory tests certificate for seed lots which have passed minimum standards to apply for MAAIF QDS certification labels. The number of labels applied for by the LSB depends on the quantity of the seed lot available for marketing and the intended units for packaging. For instance, 1,000 kg of soybean seed to be packed in 10 kg units will require 100 certification labels. Each certification labels cost UGX200/-. For now, LSBs are still applying for labels through ISSD. When a reliable procedure is defined, the LSBs will then apply for these labels directly to MAAIF.

Initially in 2015A, orders by LSBs for labels were low as it was the first time farmers were able to order tamper proof QDS labels. How-

ever, when these labels were used to package seed, sales noticeably increased due to ease by which the seed could be identified in the market. The tamper proof labels also made it easier for the LSBs to bargain for a better QDS sale price. The use of the label therefore confirms conformity to MAAIF QDS quality standards and regulations.

LSBs package and labels QDS

LSBs protect the quality of their seed by packing it using certification labels which are tamper proof, which ensures only seed lots that are tested and pass minimum standards are marketed. Packaging units vary according to different customer needs, but the most important point is that every package should carry a certification label.

Packaging and labelling is the final point of quality control by the LSBs during QDS production and marketing. Seeds are packed in smaller units to meet smallholders' demand. In some cases, large tonnages are sold to institutional buyers. When packaging is done in small quantities, for example in 3 kg, the small units are packed into larger bags of 100 kg and sealed with one certification label.

Lessons learnt

LSBs have the capacity to produce and market quality QDS which meet minimum standards. QDS is accessible, affordable and readily available locally to farmers near the LSBs. The availability of QDS is boosting

food production, ensuring food security and better household income. Promotion of QDS produced by LSBs will eventually contribute to higher agricultural production and productivity which then translates into economic development.

Higher productivity of QDS is documented by testimonies of smallholder farmers who buy these seeds from LSBs. We interviewed one of the farmers who purchased soybean QDS from the LSB in Pader. His testimony is as follows: *"We received beautifully packaged groundnut and bean seed through an organisation supporting farmers in Pader district. Each of us received 10 kg of each crop. We were excited since we never had access to seed. We were looking for improved seed for a long time as we were told we would get higher yields. To my surprise, not a single groundnut seed germinated in my field. Bean germination was also very poor, almost less than half of what I planted. I asked other farmers who received the same seed and they too had very poor germination. I decided to replant the groundnut field with soybean seed I bought from Wot Anyim LSB in Pader, which produced high yields. So I learnt that not all that is beautifully-packaged is quality seed."* **Ayella Bosco, a smallholder farmer from Pajule sub-county, Pader district.**



Treated and weighed QDS ready for bags to be sealed before delivery to the market

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Colophon

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