

# Quality Declared Seed Production Handbook For Local Seed Businesses In Uganda





# Table of Contents

<b>Foreword</b>	<b>5</b>
<b>Chapter One: Introduction to quality declared seed system</b>	<b>7</b>
1.0 Background information on QDS	7
1.1 National Seed Policy on QDS	7
1.2 Complementary benefits of QDS to certified seed	7
1.3 Who can grow QDS?	7
<b>Chapter Two: QDS Crops And Eligibility For Growing</b>	<b>8</b>
2.0 QDS Crops For Uganda	8
2.1 List of QDS crops	8
2.2 Why these crops for QDS?	8
<b>Chapter Three: Recommended Steps To Produce QDS</b>	<b>9</b>
3.0 QDS Production Guidelines	9
3.1 Registration as a seed grower	9
3.2 Identification of the right crop and variety for QDS	9



3.3 Ordering and Purchase of Basic Seed	9
3.4 Selection of suitable site QDS production	10
3.5 Land selection and preparation	10
3.6 Planting QDS fields	11
3.7 Field Management	12
3.8 Field Inspection	13
3.9 Harvest of QDS	15
3.10 Seed Bulking and storage	15
3.10 Seed sampling and testing	16
3.11 QDS labels	18
<b>Chapter Four: Safe Seed Storage And Marketing</b>	<b>20</b>
4.0 Safe Storage Of Seed	20
<b>Chapter Five: Marketing of QDS</b>	<b>21</b>
<b>Chapter Six: Experience From LSBs On QDS Production</b>	<b>22</b>
Dos for QDS production	22
Don'ts for QDS production	23
<b>Quality Assurance Chart For QDS</b>	<b>24</b>
<b>Reference</b>	<b>26</b>
<b>Annexes</b>	<b>27</b>

# Foreword

Quality Seed is basic input in agricultural production. Less than 15% of Ugandan farmers use quality seed, mainly hybrid maize. For a sustainable supply of quality seed, there is need for a well-developed human and physical infrastructure to support the production, conditioning and marketing of seed.

The Integrated Seed Sector Development (ISSD) project is supporting the development of a vibrant pluralistic and market oriented seed sector in Uganda, with support from the Embassy of the Kingdom of Netherlands.

Between 2012 and 2016, ISSD Uganda, in partnership with the National Agricultural Research Organisation (NARO), trained over 100 farmers in three zones (Northern, South Western and West Nile region) to become sustainable Local Seed Businesses (LSBs) to enhance production and supply of quality seed in their local communities. The success of this LSB model has since been out scaled to three new zones in Uganda (Eastern, South western Highlands-Kigezi and Rwenzori region) targeting 200 additional LSBs to produce Quality Declared Seed, a new seed class in Uganda.

This Handbook on Quality Declared Seed production (QDS) is therefore timely to share best practices on seed production and consolidate the approach of supporting new LSBs.

I would like to thank those who worked hard towards the preparation of this handbook. Appreciation goes to NARO Uganda and the Kingdom of the Netherlands for supporting this noble effort towards affordable quality seed for smallholder farmers in seed production and marketing.

It is our hope that this handbook can support other farmers as a sustainable effort towards producing Quality Declared Seed for household resilience.

## **Astrid Mastenbroek**

Chief of Party

Integrated Seed Sector Development (ISSD) Uganda



# Chapter One

## Introduction To Quality Declared Seed (QDS) System

### 1.0 What is Quality Declared Seed?

Quality Declared Seed is seed produced by trained groups of farmers for sale within their communities.

### 1.1 National Seed Policy on QDS

Quality Declared Seed is a seed class introduced to Uganda's seed market to improve access to quality seed of selected food crops. The National Seed Policy, 2016 recognises QDS as a seed class. Furthermore, His Excellency the President of the Republic of Uganda, Yoweri Kaguta Museveni, launched both Blue and Green seed labels for certified and QDS seed respectively during the 2016 Agricultural Trade Fair held in Jinja.

### 1.2 Complementary benefits of QDS to Certified Seed

According to the National Seed Policy, 2016, access to quality seed by farmers in Uganda is below 15% and this percentage is attained majorly through marketing of seed produced by private seed companies, most of which is maize. Quality Declared Seed

production is an initiative to complement efforts by the certified seed producers to increase access to quality seed by focusing on low value crops that are not always of commercial interest to commercial seed companies.

### 1.3 Who can grow QDS?

To be a QDS grower in Uganda, you must be formally trained and registered with the National Seed Certification Service (NSCS) under the department of Crop Inspection and Certification in the Ministry of Agriculture Animal Industry and Fisheries (MAAIF). While registering, there are conditions an individual or group intending to register as seed grower should meet and these include, but are not limited to: training skills, seed production and condition requirements, access to basic seed, availability of appropriate seed storage capacity and registration fee. There is a specific form to use during registration; ask your District Agricultural Officer (DAO) or Zonal Agricultural Research Development Institutes (ZARDIs) under National Agricultural Research Organisation (NARO) offices in your area.





# Chapter Two

## QDS Crops And Eligibility For Growing

---

### 2.0 QDS Crops For Uganda

QDS complements efforts by commercial seed companies to provide quality seed to farmers by focusing on mostly self-pollinated and vegetative propagated crops that may not always be of commercial interest to Seed Companies. However, when these crops are grown at farmer level, the cost of production is reduced while quality is highly maintained. This makes it easy for farming communities to access affordable quality seed of their preferred varieties.

### 2.1 List Of QDS Crops

Beans, soybean, groundnut, millet, sorghum, potato, cassava, sweet potato vines, green gram, pigeon peas, indigenous vegetables. Rice is grown by both seed companies and Local Seed Businesses (LSBs) for certified seed and QDS respectively.

### 2.2 Why these crops for QDS?

These crops are easy to manage, they require little isolation to maintain purity and farmers, within their context, are able to produce and market them at marginal profit. This is because most of the crops have comparatively low multiplication rates coupled with low seed replacement rates. Further to that, these are major food security crops for communities in Uganda and therefore, having their planting materials accessible at affordable rate increases production, promotes food security, income and nutritional security in the communities countrywide.



# Chapter Three

## Recommended Steps To Produce QDS

---

### 3.0 QDS Production Guidelines

What are the key steps in producing QDS?

#### 3.1 Registration As A Seed Grower

A seed grower must register. The registration process helps to evaluate whether the grower is trained, able to access quality basic seed and has requirements for seed production and marketing, including appropriate storage capacity. Registration also fosters commitment to adherence of seed production regulations through payment of the required fees.

#### 3.2 Identification Of The Right Crop And Variety For QDS

A grower or groups of growers should identify a QDS crop or variety to grow with the following attributes:

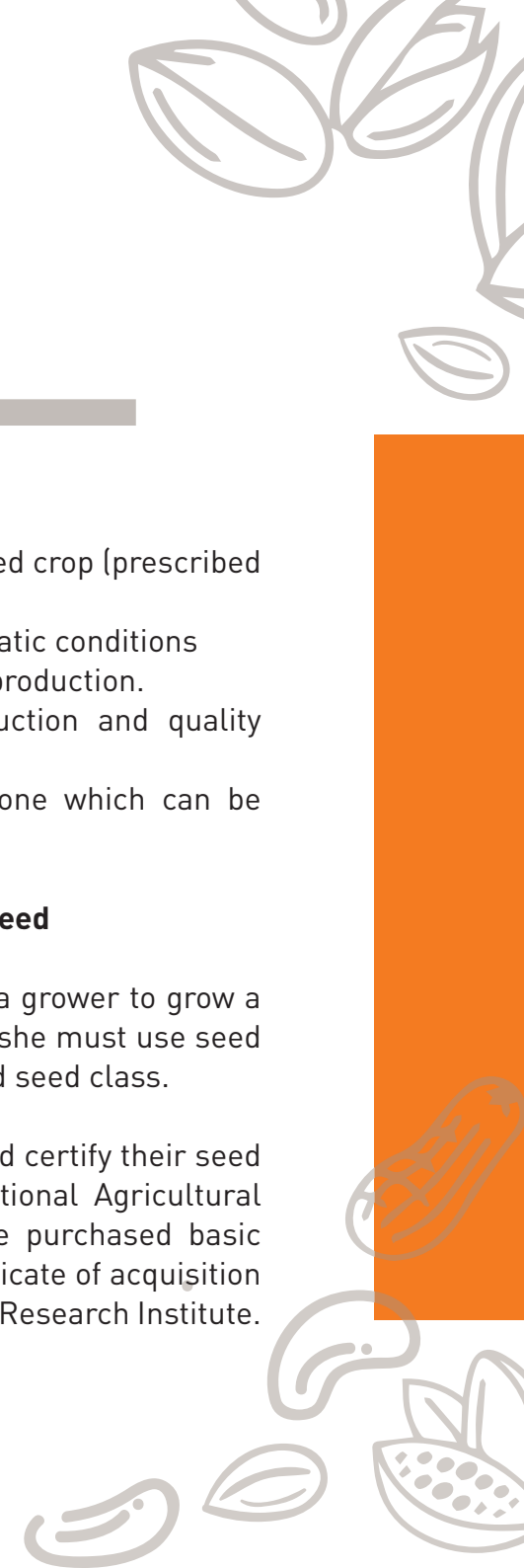
- The crop must be highly demanded in their community and therefore has available market.

- The crop should be a QDS designated crop (prescribed by the QDS regulations).
- Able to grow well in their local climatic conditions
- Easy to access basic seed for QDS production.
- Should have knowledge in production and quality control of the crop variety.
- The crop and variety should be one which can be marketed at a profit.

#### 3.3 Ordering and Purchase of Basic seed

The Seed Act, 2016 requires that for a grower to grow a crop that can be certified or QDS, he/she must use seed of known source and of recommended seed class.

All QDS growers intending to grow and certify their seed should buy basic seed from the National Agricultural Research Organisations (NARO). The purchased basic seed must be accompanied by a certificate of acquisition of basic seed from the Breeder or the Research Institute.



### 3.4 Selection Of Suitable Site for QDS Production

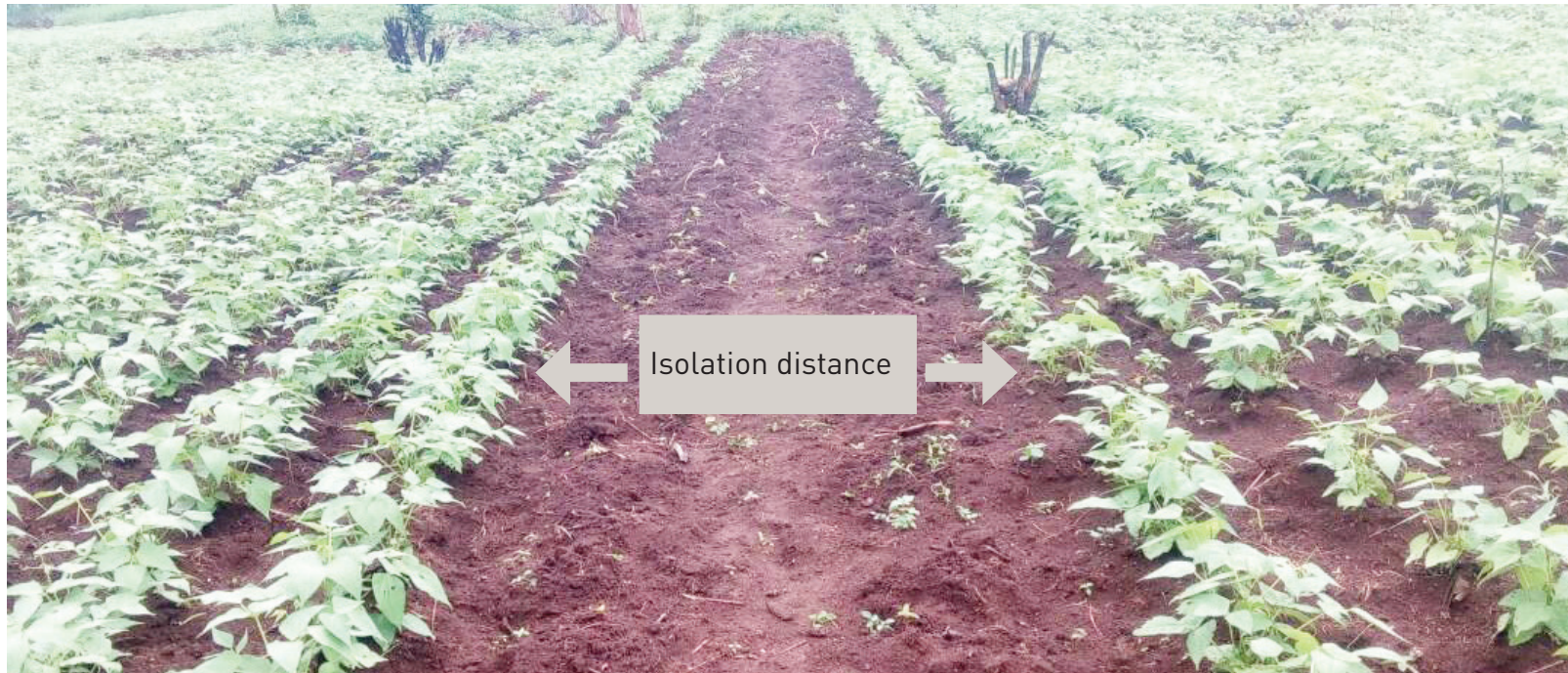
Seed requires suitable a site for production and therefore the selection of a site on which to produce seed is a very important step in ensuring the outcome of quality of seed.

### 3.5 Land selection and preparation

When selecting land for seed production, one must consider the following:

**Isolation distance:** Isolation is the practice of keeping a recommended distance between your seed crop and other fields planted with the same or similar crops of the same family that may cause contamination through any means such as: insects, wind, running water, animals and human activity.

When selecting land for seed production, one must ensure isolation is made possible as per the recommended distance for that crop *(See details in Annex)*.



**QDS Bean field showing isolation from the next field with a different variety**

**Crop history:** Check that the same crop has not been grown in that field in the past two to three seasons. Crop seed can remain in the soil or as residues and may cause contamination of the seed crop. Therefore, when selecting site, one should ensure that the history of the field selected does not compromise the quality of the seed crop to be planted.

**Site free from bad/noxious weeds:** Weed seeds, especially some bad weeds like striga, are not tolerated in the seed lot. The seed regulation has zero tolerance for weed seed of that nature. Do not select a field which has such weeds. *(See more in certifications standards in Annex).*

**Select sites with fertile soils:** Seed crop requires uniform and fertile soils for good uniform growth. Uniformity in seed fields is important in quality control. A farmer may also use other integrated soil fertility management (ISFM) options to improve or maintain the fertility of their soils for better yields such as: use of organic manure, correcting the pH<sup>1</sup> of the soil to a recommended range for crop growth and use of inorganic fertilisers, among others.

### 3.6 Planting QDS fields

Seed fields should be planted using recommend spacing to maximise yield by ensuring maximum plant population.

This requires that you plant the required quantity of seed per unit area. For instance, beans of approximately 28-30kg per acre for large seeded varieties and 26-28kg for medium size seed varieties.

**Planting in rows:** Seed fields must be planted in rows because of quality practices that may involve counting the number of plants in the field, inspection, identification of seed off-types, evaluating the plant population for yield estimation, among others. Planting in rows also allows you to have a neat seed field.



**QDS bean field being inspected by team of DAOs from South western region, Sept 2017**



**Timely planting:** Seed crop should be planted at the onset of rain to ensure adequate rainfall for its growth, especially during critical growth stages like flowering and grain filling time. This requires a farmer to prepare early for planting. Seed crops planted in timely fashion may also escape pests and disease high pressure times (when there is low rainfall).

### 3.7 Field Management

Seed crop requires extra care compared to gardens grown for food. This may also require extra investment of resources such as time, money and labour to ensure that the seed field meets minimum standards.

**Weeding:** Seed crop should be weed-free. One cannot simply weed once or twice. Always check and ensure that there is no weed in seed field.

**Roguing:** Roguing is removal of plants of a different type from the one grown for seed. Seed crop may get contaminated at any level: from basic seed, to planting, to transportation of basic seed and choosing contaminated fields. Therefore, a seed grower must inspect his/her fields and remove the wrong type, called “off-types”. Roguing must be done continuously until harvesting time to ensure that a uniform and pure variety is maintained.

**Pest and disease control:** When growing improved varieties, they are usually bred for pest and disease resistance/tolerance which supports reduction incidences and the impact of pests and diseases. However, a farmer needs to monitor the seed field regularly to ensure that there are no pest or disease-affecting crops in the field. If pests and disease identified, the farmers should use appropriate methods to reduce or eliminate them and considering use of chemicals as the last option. Pests and diseases should be controlled at critical stages of seed crop growth for instance at flowering time.



**A rogue or off-type**

### 3.8 Field Inspection

Field inspection is a systematic process of verifying if the seed field conforms to the required standards as stipulated in seed production guidelines.

Inspections check for the source of seed, isolation distance, crop history, planting practice and plant population, off-types, pests and disease presence and general hygiene of the field in terms of weeds. In QDS production, inspection is done by trained team of Internal Quality Control Committee (IQCC) and authorised external inspectors, District Agricultural Officers or Inspectors from NSCS.

#### Internal Field Inspection

This is the type of inspection done by trained members of the QDS growers or Local Seed Businesses. They support individual member groups to adhere to the recommended seed production guidelines and quality standards. They also advise members to make corrections as may be noted during inspection. If the condition of the seed crop field is appalling, they may terminate or cancel a member's seed field due to excessive contamination.

Field inspectors work for the group and therefore no specific payment is required for work done, but each group is required to organise and motivate or support the inspectors to perform through facilitating their

transportation to different fields and providing stationery and drinking water during the course of their work.

Internal field inspectors visit all the seed fields; they do not sample for inspection. Although Internal Quality Control Committees conducts inspections until crop maturity, there are critical stages that they concentrate on and these are:

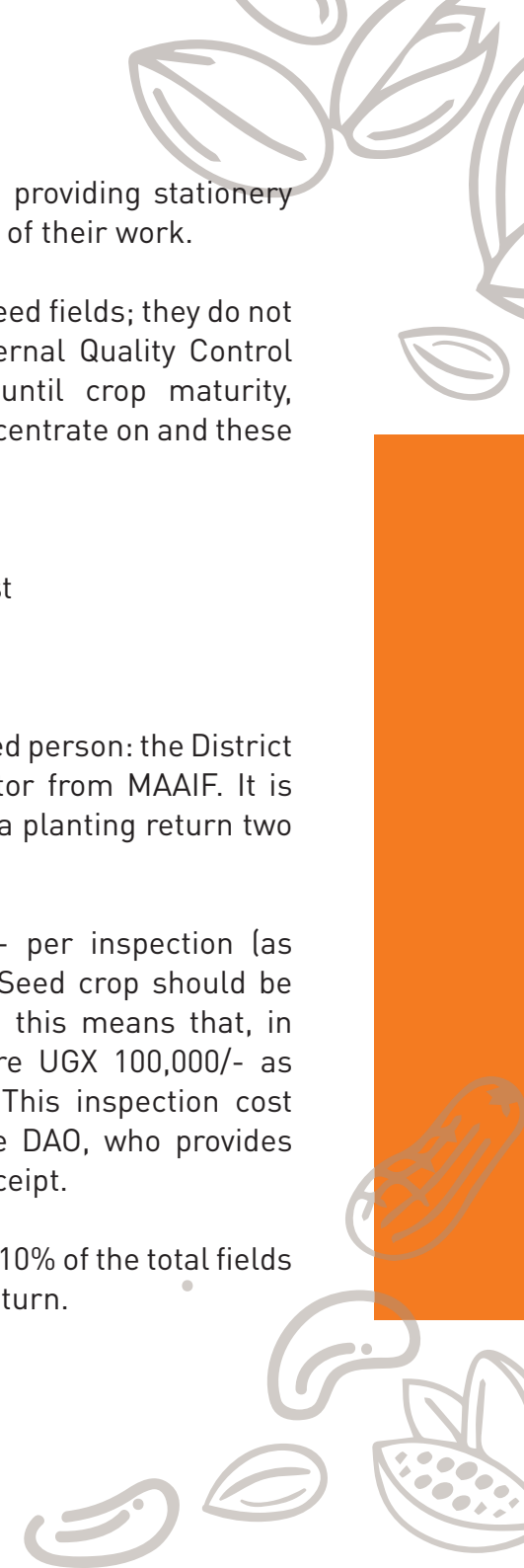
- a. Planting
- b. Flowering
- c. At crop maturity, just before harvest

#### External Field Inspection

This is done by a trained and authorised person: the District Agricultural Officer (DAO) or Inspector from MAAIF. It is required of QDS grower(s) to submit a planting return two weeks after planting.

Growers pay a fee of UGX 50,000/- per inspection (as per current draft QDS regulations). Seed crop should be inspected a minimum of two times; this means that, in one season, the LSB should prepare UGX 100,000/- as inspection fee for QDS production. This inspection cost is paid per group and is paid to the DAO, who provides acknowledgement to the group on receipt.

The inspector samples a minimum of 10% of the total fields of the LSB declared in the planting return.







**Field inspector at work in climbing QDS beans field in Kabale, during 2017A production.**



The field inspector shares the results of inspection with the QDS farmers and gives recommendations to the seed growers in the seed field.

Depending on the stage of inspection, the QDS field may be passed to continue with production for seed if it meets the minimum field standards or rejected if it does not meet the recommended quality standard as per the Uganda seed certification standards.

### 3.9 Harvest of QDS

Seed requires timely harvesting. When crop grown for seed gets physiologically mature, its embryo is fully developed and ready to grow (with the exception of those with dormancy). Therefore, if it is left to stay longer in the field, the mature embryo may be tempted to start the growing process or get damaged by heat or moisture.

Harvesting of seed crop should be timely. Follow the growth period of the variety against the time you planted it to ensure the crop is ready for harvest. Timely harvesting will help maintain the good yield.

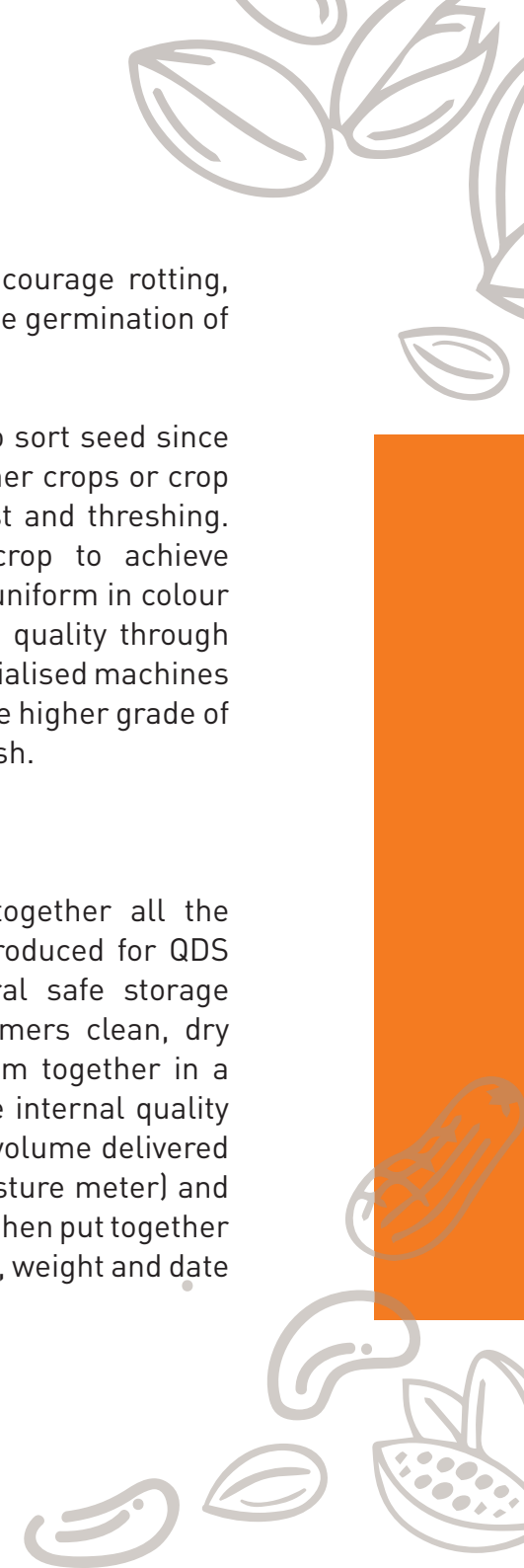
**Threshing:** Seed crop requires careful threshing so as not to inflict damage on the seed. Use recommended tools or equipment with enough care to thresh seed.

Any crack or damage on seed will encourage rotting, disease and pest attacks that will reduce germination of the seed lot.

**Sorting and grading:** It is important to sort seed since there could be inert matter, seed of other crops or crop debris, mixed with seed during harvest and threshing. Plan sufficient time to sort seed crop to achieve uniformity. Remember, quality seed is uniform in colour and size. You can achieve this level of quality through careful sorting. For large volumes, specialised machines may be used. Well sorted seed forms the higher grade of your harvest and will earn you more cash.

### 3.10 Seed Bulking and storage

Bulking is the process of bringing together all the volumes of the same crop varieties produced for QDS by the individual farmers in a central safe storage place. After production, individual farmers clean, dry and sort the seed before bringing them together in a central store. While bringing them, the internal quality control committee examines the seed volume delivered for purity, moisture content (using moisture meter) and proper labelling. The seed volumes are then put together with uniform identification (crop, variety, weight and date of production) to form a seed lot.





Seed lot is a specified quantity of seed which measures to the maximum weight prescribed by ISTA, and which is represented by one sample in laboratory test or in control plots, and which is homogenous and physically identifiable by a unique reference number.

Bulking seed in one location is important because:

1. It allows the seed producers to control the final quality of harvested seed by checking quality at delivery time.
2. It makes sampling easy.
3. Fewer number of samples are obtainable, resulting in a faster laboratory testing process.
4. Easy to control marketing and maximises profit as seed is sold at the right market price.
5. Seed stock may be used as collateral for financial services.

**Storage:** Seed should be stored in a clean, dry and safe place with bags placed on wooden raised surfaces. Seed should not be stored with food items and should not be stored in a room where people live. It is not safe to store treated seed in an environment where people live.

Human activity may also increase humidity of the storage room, hence affecting the moisture content of the seed in storage. A seed storage room should not be congested to allow easy cleaning and proper aeration. Seed bags should not touch the wall, as bags absorb moisture from the wall and affect seed germination. They should, therefore, be placed few centimetres away from the wall.

### **3.11 Seed sampling and testing**

Seed sampling and testing is the last important quality check done to verify the quality of the seed harvested. Seed sampling and testing confirms field inspections done during crop growth in the field.

#### **Who should conduct seed sampling?**

Seed sampling is done using acceptable procedure and therefore there is a need for official seed samples to be taken by trained and authorised personnel.

**National seed sampler:** Seed sampling is a specialised procedure which should be done

be a highly trained and authorised person. In Uganda, there are National Seed Samplers attached to National Seed Laboratories in Kawanda near Kampala. When samples are taken by the official seed samplers, they are called 'official samples'. When tested, you get official test results in form of a 'Blue Certificate'. Once samples taken by seed grower or any person other than the authorised seed sampler, they become private samples and when tested you get private test results in form of a 'Yellow certificate'.

**Cost of sampling:** Seed sampling is a service to a seed grower which should be paid for. LSB invites the authorised sampler and he/she takes recommended samples using standard procedure and tools. The number of samples to be taken depend on the quantity of QDS available in the store.

**Conditions for sampling:** QDS should be clean and packed in clean bags that are well labelled. When seed is produced by different farmers, it should be brought to one central place (bulked) or stored for easy sampling.

#### Details for labeling QDS bags in the store to support sampling process

- Name of LSB and Code (Ask ISSD for your LSB CODE)
- Name of crop
- Variety
- Quantity in kilogrammes
- Name of seed grower
- Season of production e.g. 2017B or 2018A

**Seed testing in the Laboratory:** Seed samples are taken to seed testing laboratories for analysis: for QDS, analysis is done for purity, germination percentage and moisture content: *(See acceptable standards for different crops in Annex 2).*

**Treatment of results:** The seed testing results is collected by the seed grower; the samples which have passed laboratory standards are labelled: 'Recommended for marketing as seed'; those which failed are 'Not recommended for marketing as seed'.



After getting your seed testing results, check the recommendation to guide you on what to do with the QDS. Selling seed which is not recommended for marketing as seed is a crime. When caught, the culprits shall be taken to the Courts of Law in Uganda and charged accordance to the as per Seed Act, 2016

### **3.12 QDS labels**

To differentiate QDS from other seed classes, Government, through MAAIF, has come up with a unique tamper-proof labels which is green in color. The label is the same in content with the certified seed label (Blue) but only differs in colour.

QDS labels are printed only by NSCS of MAAIF. The QDS grower (LSB) has to order (depending on the final number of seed packages to be labelled) and pay for the label to be printed at the cost of UGX 200/- per label. Request for QDS labels must be submitted to NSCS with copy of official seed test results from authorised laboratory.

After receiving the label, the QDS is then packed and a tamper-proof label is inserted to certify its quality to the buyer.



**QDS Label (L) and Sample of QDS packed seed with tamper-proof QDS label inserted (R)**

# Chapter Four

## Safe seed storage

---

### **Why does seed require suitable storage before marketing?**

Seed is mainly demanded during the planting period, not at harvest time unlike grain. That means, from the time of harvest seed requires proper storage until the planting time when it is demanded by farmers.

Conditions for proper seed storage include:

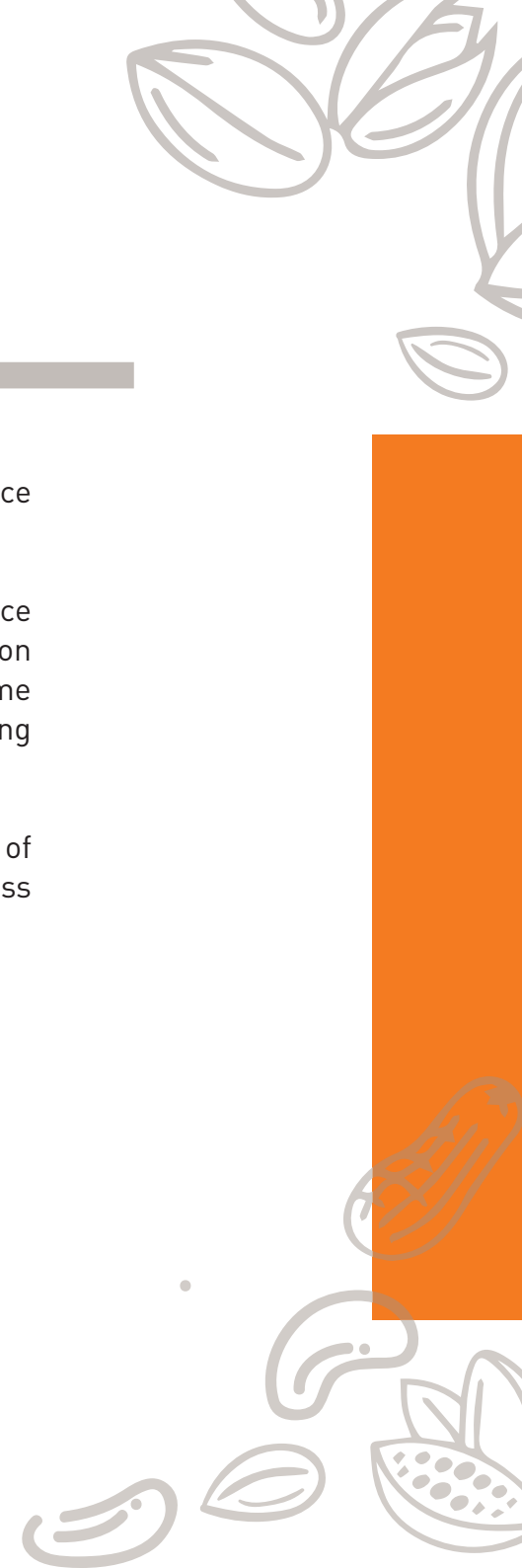
- Dry seed to the right moisture content.
- Store in a dry place; use of palettes is recommended to avoid storing seed on the ground.
- Ensure sufficient aeration to keep the store at the right temperature
- Place similar varieties together.
- Do not stack more than three 100kg bags; this puts a lot of weight on the lower bags, which may cause damage.
- Do not store other items in seed rooms; e.g. pumpkin, sugar cane, empty jerricans and containers. They can attract pests and encourage the development of mould.
- Do not sleep in same room as stored seed.
- Place insect deterrents in the room e.g. aluminum phosphate tablets.
- Do not place the bags touching the store walls. The wall usually gets cold at night and hot during day and this temperature variation is not healthy for seed storage.

# Chapter Five

## Marketing of QDS

---

- QDS should be marketed to the communities surrounding the LSBs. This will reduce transportation cost and ensure that the cost of QDS is affordable to farmers.
- QDS should not be stocked with agro dealer shops as this will increase the price of seed per kilogramme since agro dealers are middlemen whose business relies on profit. Therefore, when QDS is stocked at agro dealer shops, their cost per kilogramme is likely to increase, making it less affordable to LSBs. However, QDS village marketing agents can stock QDS for distribution in the villages.
- QDS is meant to be affordable to farmers. Therefore, LSBs should price the cost of QDS carefully to improve access to quality seed whilst maintaining their seed business by earning a modest profit margin from QDS sales.



# Chapter Six

## Experience from LSBs on QDS production

---

### The Dos of QDS Production

- LSBs buy basic seed from known sources; usually from Zonal Research Development Institutes /NARO or authorised multipliers of basic seed.
- Obtain certificate or document that shows that you obtained seed from the right source; usually certificate of acquisition given.
- Verify the suitability of fields identified by individual members for QDS production; isolation, crop history and presence of noxious weeds.
- Plant using recommended spacing; use the right seed rate to achieve optimum plant population.
- Plant only one type of crop in QDS seed field.
- Record planting return.
- Submit planting return copy to DAO/MAAIF for inspection.
- Keep seed fields weed-free by weeding in timely fashion (weed before the weed flowers and produces seed).
- Rogue regularly to keep purity; rogue a minimum of three times: after first weeding, at flowering and at maturity (just before harvest).
- Ensure your field is inspected by DAO/MAAIF.
- Harvest in time.
- Do proper cleaning of the seed.



- Dry well before storage.
- Request for seed sampling and testing.
- Apply for QDS labels.
- Bag your QDS and insert tamper-proof labels.
- Market your QDS at a profit.

### **The Don'ts of QDS production**

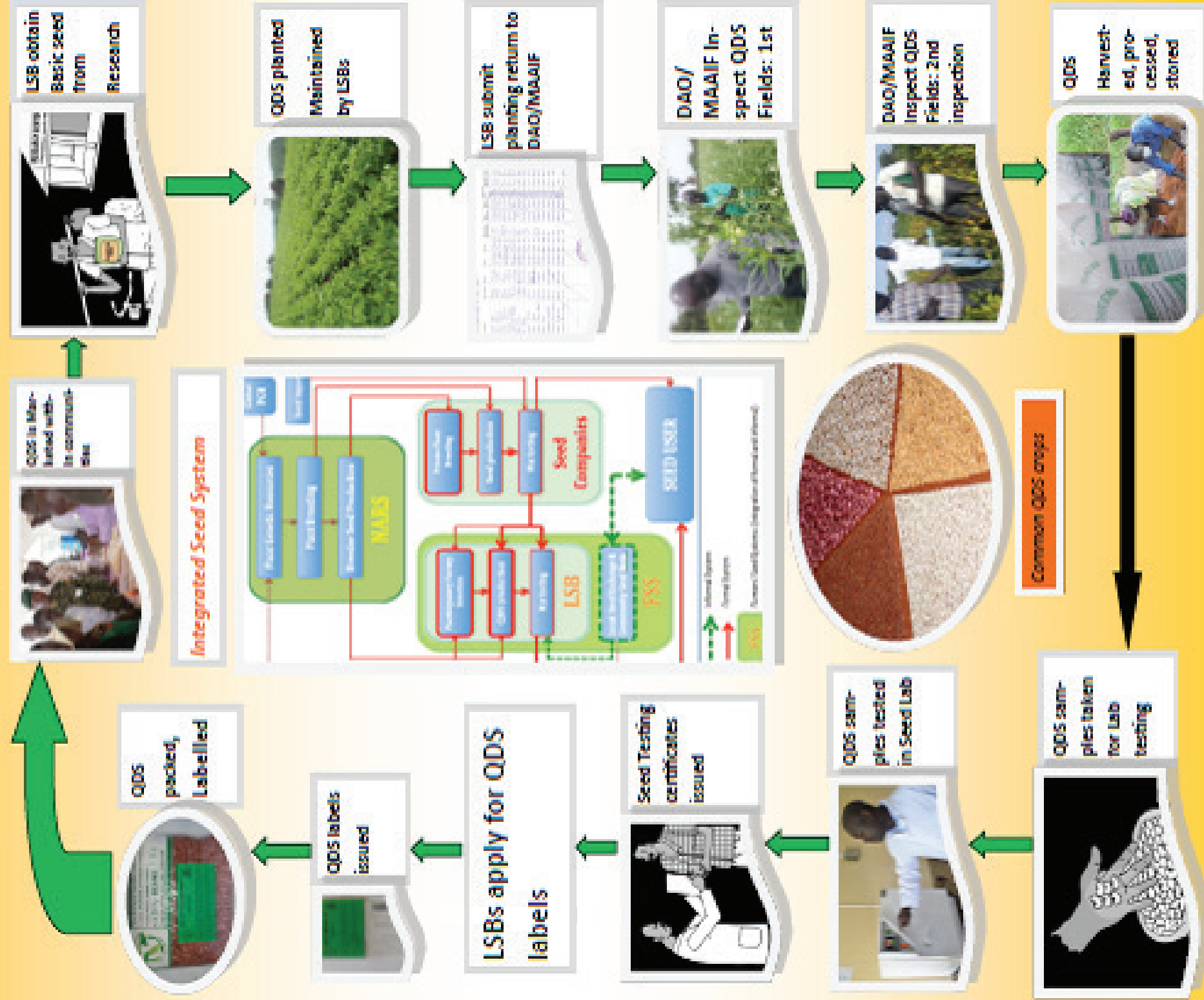
- Don't plant basic seed with unknown source; evidence of source is key.
- Don't replant QDS field from harvest of previous QDS production except if authorised by the breeder.
- Don't plant seed field where it is not possible to get required isolation.
- Don't broadcast seed field during planting.
- Don't mix crops in QDS seed fields; plant in single stand.
- Don't forget to record planting return.
- Don't forget to submit planting return on time to the DAO/MAAIF.
- Don't forget to remind the DAO/MAAIF to inspect your QDS field.
- Don't throw or leave off-types or rogue in QDS fields; bury or burn them in an appropriate place.
- Don't mix QDS during harvest, threshing and drying.
- Don't treat QDS before getting seed testing results from laboratory.
- Don't sell treated, packed and labelled QDS to seed companies.
- Don't stock QDS in agro-dealer shops.



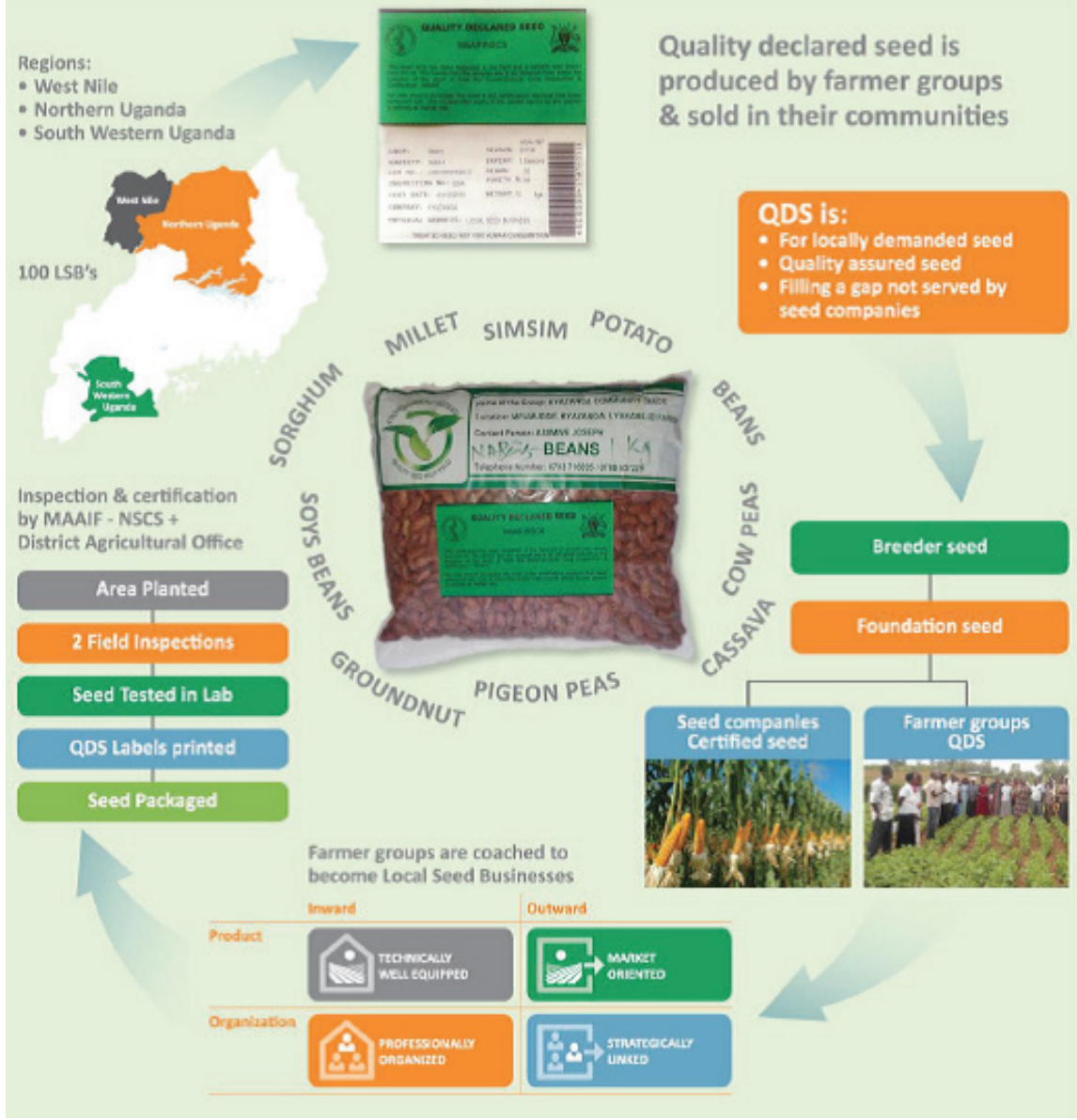
# QUALITY DECLARED SEED SYSTEM



Odiim .G., Muwamika T.C., Oyea. P. and Mostenbroek. A., ISSD UGANDA



# QDS: High quality seed for and by farmers



# References

1. Uganda National Seed Certification Handbook, MAAIF
2. Uganda Seed and Plant Act. 2006
3. Uganda Seed Policy, 2016
4. Local Seed Business Manual for Uganda, 2015

# Annexes

## Annex 1: Minimum isolation distances (meters)

SPECIES	LAND ROTATION	PRE-BASIC	BASIC	CERTIFIED
<b>Cereals</b>				
Maize	0	400	400	200
*Sorghum		200	100	50
*Bulrush millet		400	400	200
Rice	1	10	5	2
Finger millet		10	5	2
Wheat		10	10	4
Barley		10	10	4
<b>Pulses</b>				
Beans	0	20	10	10
Soybeans		20	10	5
Groundnuts		20	10	5
Cow peas		50	50	25
Peas		50	50	25
<b>Oil Crops</b>				
**Sunflower		1.5km	1km	800
Simsim		20	10	5
<b>Herbage Grasses</b>				
*Rhodes grass		200	200	100
*Setaria grass		200	200	100
Congo signal		50	50	25
Guinea grass		50	50	25
Sudan grass		400	400	200
Columbus grass		400	400	200
<b>Pasture legumes</b>				
Stylo		200	200	100
Desmodium		200	200	100
Siratiro		200	200	100
Clover		800	800	400
Luceme		800	800	400
<b>Vegetables</b>				
Tomato		100	100	50
Lettuce		100	100	50
Cucurbits		500	500	250
Brassicas		400	400	200

Source: seed certification handbook for Uganda

## ANNEX 2: Off-types and other cultivars standards

SPECIES	PRE-BASIC	BASIC	CERTIFIED
<b>CEREALS</b>	Maximum number per 10000 plants		
Maize	0	0	100
Sorghum	0	0	50
Bulrush millet	0	0	20
Rice	0	0	10
Finger millet	1	1	6
Wheat	1	1	1
Barley	1	1	6
<b>PULSES</b>	Maximum number per 10000 plants		
Beans	0	0	10
Soybeans	0	0	10
Groundnuts	0	0	10
Cowpeas	0	0	2
Peas	0	0	2
<b>OIL CROPS</b>	Maximum number per 1000 plants		
Sunflower	0	0	5
Sesame	0	0	5
<b>HERBAGE GRASSES</b>	Maximum number per 100 square metres		
Rhodes grass	4	4	12
Setaria grass	4	4	12
Congo signal	4	4	12
Guinea grass	4	4	12
Sudan grass	0	0	2
Columbus grass	0	0	2
<b>PASTURE LEGUMES</b>	Maximum number per 100 square metres		
Stylo	0	0	2
Desmodium	0	0	2
Siratro	0	0	2
Clover	0	0	2
Luceme	0	0	2
<b>VEGETABLES</b>	Maximum number per 1000 plants		
Tomato	0	0	6
Lettuce	0	0	3
Cucurbits	0	0	3
Brassicas	0	0	3

## ANNEX 3: Standards for Diseases

SPECIES	PRE-BASIC	BASIC	CERTIFIED
<b>CEREALS</b>	Maximum number per 10000 plants		
Maize	0	0	100
Sorghum	0	0	50
Bulrush millet	0	0	20
Rice	0	0	10
Finger millet	1	1	6
Wheat	1	1	1
Barley	1	1	6
<b>PULSES</b>	Maximum number per 10000 plants		
Beans	0	0	10
Soybeans	0	0	10
Groundnuts	0	0	10
Cowpeas	0	0	2
Peas	0	0	2
<b>OIL CROPS</b>	Maximum number per 1000 plants		
Sunflower	0	0	5
Sesame	0	0	5
<b>HERBAGE GRASSES</b>	Maximum number per 100 square metres		
Rhodes grass	4	4	12
Setaria grass	4	4	12
Congo signal	4	4	12
Guinea grass	4	4	12
Sudan grass	0	0	2
Columbus grass	0	0	2
<b>PASTURE LEGUMES</b>	Maximum number per 100 square metres		
Stylo	0	0	2
Desmodium	0	0	2

Source: Seed Certification Handbook  
For Uganda



## ANNEX 4: Standards for weeds

a) Maize	Head smut ( <i>Sphacelotheca reiliance</i> (Kuhn) Clint) Common smut ( <i>Ustilago maydis</i> ) (DC) Corda)	Nil during any inspection Nil during any inspection
b) Wheat Oat Barley and Triticale	Bunt ( <i>Tilletia foetida</i> (Wallr Limo) Loose smut ( <i>Ustilago</i> spp) Ergot ( <i>Claviceps</i> spp) Covered smut ( <i>Ustilago hordei</i> (pers) Lagerh	1 head per 100 sq m 1 head per 100 sq m 1 head per 100 sq m 1 head per 100 sq m
c) Sorghum	Covered smut ( <i>Sphacelotheca sorghi</i> ). Bunt ( <i>Sphacelotheca cruenta</i> (Kuhn) S. sorghi. Mildew ( <i>Perenosclerospora sorghi</i> ) Ergot ( <i>Claviceps</i> spp) Head smut ( <i>Sporisorium reiliamum</i> )	1 plant per 1000 plants 1 plant per 1000 plants 1 plant per 1000 plants 1 plant per 1000 plants 1 plant per 1000 plants
d) Beans	Halo blight ( <i>Pseudomonas phaseolicola</i> ) Anthracnose ( <i>Colletotricum lindemuthianum</i> Bean common mosaic virus (BCMV) Common blight ( <i>Xanthomonas phaseoli</i> ) Aschochyta leaf spot	None during final inspection None during final inspection None during final inspection None during final inspection None during final inspection.
e) Peas and Cowpeas	Leaf blight ( <i>Pseudomonas phaseolocola</i> ) Pod spots ( <i>Mycosphaerella pinodes</i> ) Bacterial blight ( <i>Xanthomonas vignicola</i> )	None during final inspection None during final inspection None during final inspection
f) Soybean	Bacterial blight ( <i>Pseudomonas</i> spp Bacterial pustule ( <i>Xanthomonas phaseoli</i> ). Photonic	None during final inspection None during final inspection None during final inspection
g) Sunflower	Sclerotinia wilt and head rot ( <i>Sclerotinia sclerotiorum</i> verticillium wilt ( <i>Verticillium dahliae</i> )	5 plants per 1000 plants 5 plants per 1000 plants
h) Groundnuts	Rosette ( <i>Alphis craccivova</i> ) Bacterial wilt ( <i>Pseudomonas salanacearum</i> )	5 plants per 1000 plants 5 plants per 1000 plants
i) Finger millet	Blast ( <i>Piricularia grisea</i> ) Ergot ( <i>Claviceps</i> spp)	1 plant per 100 plants 1 plant per 100 plants
j) Rice	Blast ( <i>Piricularia oryzae</i> ) False smut ( <i>Ustilaginoidea virens</i> ) Kernel Smut ( <i>Tilletia barclayara</i> ) Ergot ( <i>Claviceps</i> spp)	1 plant per 1000 plants 1 plant per 1000 plants 1 plant per 1000 plants 1 plant per 1000 plants

Source: Seed Certification Handbook For  
Uganda





Studio House – Ground Floor, 5 Bandali Rise, Bugolobi  
P.O. Box 20106, Kampala  
Tel: +256 (0) 771007628  
Email: [info@issduganda.org](mailto:info@issduganda.org)

[@ISSD Uganda](#)  
[www.issduganda.org](http://www.issduganda.org)

