

# **CERTIFIED SEED QUALITY ASSUARANCE PROCEDURES**

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# Seed System In Kenya

## INTRODUCTION

- Wheat seed operations involve many institutions- often uncoordinated and lack expertise in local and national seed and crop systems.
- Hence does not adequately address the real constraints affecting access to quality seed by the resource-poor farmers
- This results in increased use of farmer saved seeds of the adapted varieties than certified seed
- This seed is produced and maintained at farm level by the small holder farmers/farmer groups with little/no quality assurance measures
- Seed regulatory frameworks have deficiencies in seed laws and plant breeding protocols in developing countries
- A new crop variety faces two challenges
  - ✓ stocking up on seed
  - ✓ its distribution to meet expected demand (IAEA, 2008)

# Seed system in Kenya...

## Wheat seed production potential

- Wheat seed production potential has not been fully realized
- Researcher/farmer participatory variety evaluation enhances desirable cultivar identification, development and adoption by the farmers/processors
- Participatory on-farm selection & evaluation of elite cultivars with farmers has not been adequately embraced and popularized
- This leads to low seed multiplication scale, short life span of improved varieties in production before the yield potential declines
- When a variety takes too long to multiply and disseminate, it may lose its usefulness by the time it reaches the farmers/market.
- Other suggested ways for seed production and multiplication are:
  - Informal secondary seed production
  - Use of irrigation
  - Participation of private sector.

# Seed system in Kenya...

## **Informal seed production on farmers' fields could help to :-**

- meet farmers' seed demand
- facilitate dissemination, diffusion and adoption of the new crop varieties
- Lack of infrastructure for seed merchants may lead to static production and sales because:-
  - Farmers keep large quantities of grain for seed in addition to lack of credit accessibility.
  - If basic seed will come solely from specific source/body, the merchant cannot program his production so he must maintain his varieties
- Land fragmentation
- High cost and lack of adequate seed processing machines/spare parts for the small holder
- Price control by the government

# Seed system in Kenya...

- **Variety Replacement**

- Over time released commercial varieties may lose their resistance to diseases, insect pests and production potential.
- This limits the number of generations that a variety should remain in production before a new one is released.
- The global average age of variety replacement is seven years
- Slow varietal turnover reflects a poorly developed seed industry and weak extension services.
- This encourages farmer to farmer seed exchange in wheat growing areas.

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# Variety replacement...

- Old varieties need replacement with new pests/disease resistant and high yielding wheat varieties.
- Seed/variety replacement is variable according to the variety grown.
- Some varieties take longer to replace because of their qualities that farmers/processors cherish

**Example [Test weight: Kwale=80.2 kg/HL, Eagle 10=79.5 kg/HL and K Korongo=78.7 kg/HL]**

- Problems faced by farmers in replacing their seed frequently include:-
  - High cost of certified seed
  - unavailability of certified seed
  - Limited/credit unavailability
  - lack of information –awareness of the existence of the new improved varieties.

# Variety replacement...

- Awareness can be improved by:-
  - Interaction between researchers, farmers/processors/millers etc
  - broadcasting over the radios,
  - pamphlets,
  - demonstrations and field days,
  - roadside advertisements etc.
- Increased awareness increases demand for the new variety
- However the demand for the new varieties at the farm level will be determined by:-
  - the cost of the seed and
  - financial capacity of the farmers to afford the seed.
- Knowledge of farmer's/processors contribute strongly to the length of time farmers can maintain appropriate seed quality.

# Certified Seed Production

- The source of seed is from nucleus breeder/foundation seed
- or any source approved by the certification agency - KEPHIS
- Seed from breeders stage 3
- Pre basic
- Basic
- C1, C2, C3
- Wheat seed is mainly grown in rotation with any other crop eg maize, potatoes, oil crops (canola, sunflower) legumes etc



# Certified seed production...

## Land requirements

- Land requirements for certified seed
  - production Virgin/under grass
  - Had no wheat crop for two seasons
  - Must be verified
  - Beans
  - Vegetables
  - Potatoes
  - Oil crops



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# Certified seed production...

## Good agricultural practices

Good seed bed preparation & early planting

- Appropriate fertilizer application rates
- Appropriate seed rates recommended for the variety in question
- Good planting methods/efficient machinery well calibrated
- Control of insect pests, diseases and weeds -spraying right chemicals, timing and rates (friendly to the environment)



# Certified seed production...

- **Manage noxious weeds**
- Noxious weeds must be eradicated/controlled in a seed wheat field



Datura (*Datura stramonium*)



Darnel Ryegrass (*Lolium temulentum*)



Wild oats (*Avena sativa*)

# Certified seed production...

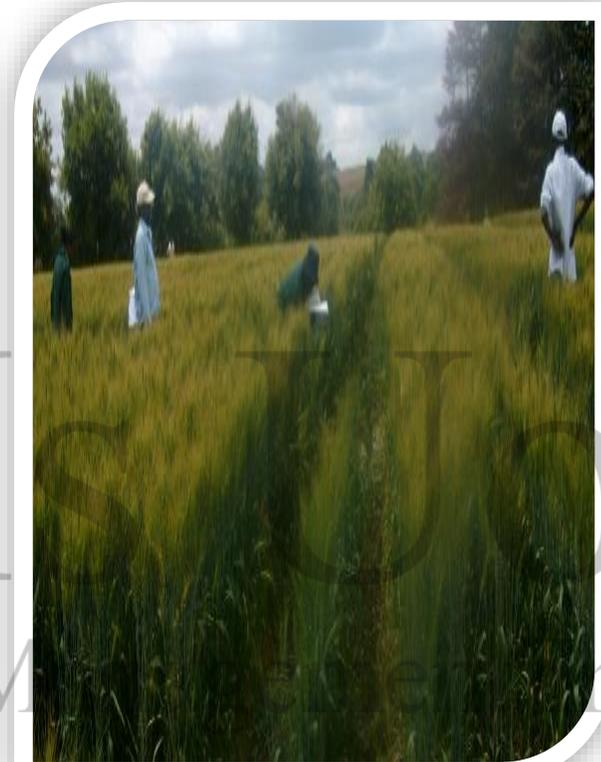
- **Rogueing of off types in the field**
- Two to three rogueing may be necessary
  - Just ahead of the flowering stage
  - Just after flowering is completed and before the crop starts to turn colour
  - After the ears/heads turn colour and start to mature



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# Certified seed production...

- **Field inspection**
- At ear emergence and seed has started to fill
- Glume and seed color can be seen



Joint field inspection by KEPHIS and KALRO staff

# Certified seed production...

- **Harvesting**
- Supervised harvesting by KEPHIS
- and KALRO staff
- Harvested during dry weather
- Harvesting is done at grain moisture of  $\leq 14\%$
- Cleaning machine after harvesting each variety to avoid mixing
- Ensure that ideal crop nutrition was practiced



# Post Harvest Handling...

## Transportation:

- Each variety is transported alone  
Must to avoid any contamination
- Have a movement permit if across more than one county boundaries
- Where possible tracks must be sealed after supervised loading
- Weights are recorded



# Certified seed production...

- **Post Harvest Handling:**
- Sun/machine drying (if drying is needed)
- The seed is assigned a lot number by
- KEPHIS Cleaning: cleaner inspected and passed by KEPHIS after/before cleaning every variety
- Cleaned seed is sampled by KEPHIS before chemical treatment/dressing
- Treated seed must be inspected & passed by KEPHIS for labelling, packaging and storage or releasing to the farmers/market



# Clean seed ready for dressing and packaging

Cleaned seed is sampled by KEPHIS before chemical treatment/dressing



# Prescribed seed standards for seed certification (ISTA)

Seed class	Germination %	Moisture %	Pure seed min	Inert matter %	Other crop seed max	ODV (max)	Object-able weed seed (max)
Foundation seed	85	12	98	2	10	-	10
Certified seed	85	12	98	2	10	-	20
<b>Field standards</b>							
Seed class	Off-type	Pollen shading	Object-able plant	Plant heads affected by designated disease			
Foundation seed	0.050	-	0.010	0.10			
Certified seed	0.1	-	0.020	0.50			

# Seed Labelling

SEED CLASSIFICATION AND LABELING		
CLASS OF SEED	CODE	LABEL COLOUR
Breeder seed	BR	White
Pre-basic (super elite)	PB	White
Basic (elite)	B	White
Certified 1 <sup>st</sup> generation	C1	Blue
Certified 2 <sup>nd</sup> generation	C2	Pink
Certified 3 <sup>rd</sup> generation	C3	Pink
Certified 4 <sup>th</sup> generation	C4	Pink
Certified 5 <sup>th</sup> generation	C5	Grey

# Packed seed ready for storage and marketing

## • Post Harvest Handling:

### Packaging

- Branded bags
- Well Labelled to show
  - Growers/merchants name
  - Show variety name,
  - Class of the seed
  - Lot Number
- Net weight 50 kg



# Certified seed storage

**Seed should be stored under the following conditions**

- **Moisture content  $\leq$  12 %**
- **Relative Humidity 50-60 %**
- **Clean bagged seed stored in insect and rodents proof warehouses**
- **Rodents controlled by traps and poisons, complete exclusion, sanitation and sanitation**
- **Insects controlled by insecticides and fumigants**
- **Use safest fumigants that will not reduce germination**

# Certified seed storage

The stored seed must be monitored for the following factors

**1.** seed viability [germination tests done routinely]

1. Seed vigour on germinated seedlings

2. Storage space sanitation by fumigating the stores against rodents and weevils



# Marketing / Distribution

- It is very critical for the certified produced seed to be disseminated to the relevant end users in time.
- These end users include
  - Farmers
  - Seed merchants
  - Stockists
  - Other institutions involved in seed bulking

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*Thank you for listening*

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