RICE BREEDER AND CERTIFIED SEED PRODUCTION

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University of Nairobi A SEMIS COURSE FOR INTERNATIONAL TRAINING FOR CAPACITY BUILDING ON SEED PRODUCTION AT CAVS 28TH MAY TO 3RD JUNE 2017

OUTLINE

- Introduction
- Rice research
- Seed certification and production
- Methods of seed production
- Conclusion

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INTRODUCTION

What is seed?

 is a small embryonic plant (propagule) enclosed by a seed coat with some stored food. (seed, seedlings, corm, cutting, bulb, bulbil, layer, marcott, scion, root, runner, split, set, stem, stock, stump, sticker or tuber)

Issues of seed quality

- Required variety
- Analytical purity; freedom from weeds, other seed and inert matter
- Good plant establishment
- Freedom from disease and pests

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- Normal moisture content
- Well and uniform formed seeds

Why quality seed?

- High quality seed means
 - Healthy crop establishment (germination)
 - Low replanting rate
 - · High yields per unit area
 - Early maturity
 - Good profitsSeed Enterprises Management Institute
 - Easy harvesting and processing
 - Easy grading of products MVEISILY Of NairOO





Rice Research

- Its about matching variety to production environments and market demand
- It entails breeding for desirable attributes: yields, grain quality, disease and pest tolerance, market niche etc.
- Up grading of local cultivars to solve their limitations.
- Yield Evaluations METs
- NPT
- Release by NVRC
- Commercialization



Improved germplasm evaluation for desirable attributes



Seed

A) Informal seed systems

- 1) Farmers own home saved seed
- 2) Seed fairs
- 3) Market grains
- 4) Research institutes

B) Formal seed system

- i) Panicle to rows
- ii) Nucleus seed
- iii) Labelled breeder seeds

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- iv) imported seedsUniversity of Nairobi

REQUIREMENT FOR SEED CERTIFICATION AND PRODUCTION

- The Seeds and Plant Variety Act (Cap 326), stipulate that varieties can only be released for commercialization if they show agricultural superiority
- They must be sufficiently distinct, unifrom and stable (DUS)
- The variety descriptor must be in placent Institute
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1) Farmers own home saved seed

- Possible for self pollinated crops, vegetatively propagated crops and open pollinated varieties (OPV)
- For rice, farmers can rogue off-types to maintain a uniform crop for next season crop establishment
- Farmers can also select representative panicles (>1000) to set up seed production
 - Especially when the crop is highly mixed up for rouging to be effective

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• 2) Seed fairs

- These refer to a space where traders display their products and buyers come to purchase what they need
- Normally organize by a seed committee
- Seed is cheaper than from seed companies



- Farmers buy grains from market and use them as seed to establish a crop Enterprises Management Institute

4) Research institutes

-Mainly during variety testing for adaptability and adoption, or buying



- i) Panicle to rows (stage 1)
 - Method used to establish seed system for a variety
 - Single panicles are selected from a population
 - Each panicle is grown in a row
 - The breeder with stakeholders conduct joint observations for distinctiveness, uniformity & stability (conformity with variety descriptor)
 - Any plant not conforming with descriptor lead to row rejection
 - Conforming rows are harvested individually

- Single plots (stage 2)
 - Seeds from each row are planted in a plot (>10 M²)
 - i.e. Number of approved rows = Number of 10 m² plots
 - Joint observation just like for panicle to row is conducted
 - Any plot with non-conforming plant(s) is rejected
 - Conforming plots are bulk harvested for each variety Seed Enterprises Management Institute
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❖ Bulk plot (1-20 acres) stage 3

- The seed harvested from stage 2 is planted in between 1-20 acres for inspection and certification as breeder seed.
- In this case any off-type (s) is rogued off
- The crop at maturity is harvested as breeder seed
- NB/ for stage 1-3 the isolation distance is 10 m all round the crop













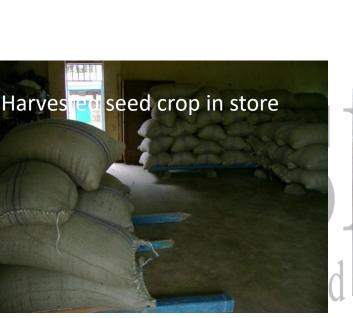


Joint Observation



Seed treatment

Seed Processing









Seed dispatch

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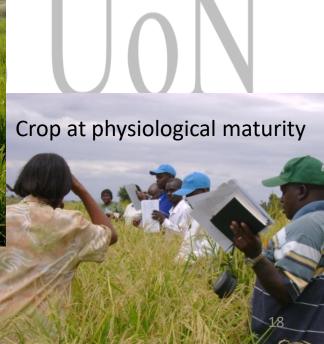
Single plot stage —irrigated rice











Rice Seed Production Systems









• ii) Nucleus seed

- In case of bred varieties, the small quantities with the breeder or accessions are used to establish seed system
- The nucleus seed is multiplied into breeder seed
- The breeder seed is increased into foundation seed [pre-basic and basic seed] (up to here, the breeder is involved)
- The foundation seed is multiplied to produce is interested to produce is interested.
- Registered seed is used to produce certified seed

iii) Labelled breeder seeds

- » These can be used to establish seed system of a variety (under MoU)
- » They are increased into foundation seed
- » The foundation seed into registered seed
- » And registered seed into certified seed

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- iv) imported seeds
 - These are usually accessions from GCIAR, NARS or regional programmes
 - These can be used to establish seed systems for a variety thro' any of the methods above

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Seed certification

- Seed certification is undertaken by an independent authority for purpose of agricultural products quality assurance.
- Certification is done in the field, during processing and post control

Field certification

- This involves observing the crop for distinctiveness, uniformity and stability
- Absence of weeds, especially noxious weeds, diseases and other aberrant traits
- ➤ Checking on isolation requirements
- ➤ Crop stand status and lodging
- Estimating yield per unit area

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Factory processing

- ✓ Once the seed crop is approved for harvesting, a transport order is issued for delivery to processing store.
- ✓ Seeds are cleaned ready for processing
- ✓ In the store, the machines are inspected for any other seed and working condition
- ✓ Samples (untreated are taken) for purity test, diseases and pests observation
- ✓ Seed lot is then treated and sampled (for germination test)
- ✓ The seeds are labelled appropriately, sealed and stored

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Post Control

- This is normally undertaken to ascertain the quality of seeds farmers are accessing
- Its normally undertaken by seed agency in collaboration with stakeholders

➤ Why use good seeds:

- ✓ Good germination
- ✓ Eliminate replanting
- ✓ Uniform crop
- ✓ Vigorous early growth
- ✓ Early maturity
- ✓ Higher yields
 Friday, July 6, 2018



Seed Marketing and distribution

- For commercialization of a variety, seed must be accessible and affordable to farmers
- NARS are best placed for high status material development
- Seed companies or merchants are the best placed to undertake certified seed production
 - Because; have marketing and distribution infrastructure
 - Are in contact with network of seed growers
 - Have processing infrastructure Management Institute
 - Have a tradition in certified seed production
 - Some are public companies CISITY OF INAUTODI
 - They are profit oriented

Seed Systems Establishment





Conclusion

- Quality seeds are a prerequisite for good crop yields
- Isolation and proper agronomic management are vital for production of quality seeds
- Proper seed handling, right from harvest to storage of dressed and packaged seed is crucial as seed is a life form
- People with basic seed technology knowledge are imperative in seed production
- Seed business is highly profitable, but price put should not be a constraint to farmers

