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DUS TESTING

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SEMIS UON

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DUS Testing



- A DUS test seeks to establish if a new variety is:
- Distinct from all commonly known varieties existing in one or more characteristics

- Uniform The variety must be sufficiently uniform in essential characteristics
- Stable The variety must remain true to its description after repeated propagation
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DUS testing cont'd

Definition of Plant Variety

- a plant grouping within a single botanical taxon of the lowest known rank,
- defined by the expression of the characteristics resulting from a given genotype or combination of genotypes
- distinguished from any other plant grouping by the expression of at least one of the said characteristics and Enterprises Management Institute
- considered as a unit with regard to its suitability for being propagated unchanged;

Purpose of DUS testing



- In Kenya, DUS is undertaken to achieve three purposes:
- Plant Variety Protection to qualify for protection, a new variety needs to be <u>Distinct</u>, <u>Uniform and <u>Stable</u>
 </u>
- Variety Release a system of listing of varieties exists and for a variety to be listed, it needs to be <u>D</u>istinct,
 <u>U</u>niform and <u>Stable</u> in addition to being agronomically superior to existing varieties (VCU = NPT)
- Seed Certification Kenya has a system of compulsory certification and generates descriptors for use in the process

Steps in DUS testing



- Planning the DUS trial
- Designing the DUS trial
- Assembly of the requirements
- Setting up of the DUS test
- Observations and data recording Seed Enterprises Management Institute
- Analysis and interpretation of data in bit
- Preparation of DUS report

Planning a DUS trial



- Review database on the crop
- Examine descriptor of candidate
- Identify reference & comparative varieties
- Estimate size of trial
- Determine crop-specific requirements
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- Identify facilities requiredy of Nairobi

Designing the DUS trial



- Depends on method of examination based on kind of crop, capacity and available information
- □ Three methods:
 - □ Growing test establishment of a growing trial, mostly applies to annual crops e.g. maize, beans, wheat etc
 - On-site inspection uses materials on breeders' fields,
 applies to perennial crops e.g. coffee, tea, sugarcane
 - Purchase of DUS reports from UPQV members that utchave registered the variety for ornamentals

Assembly of requirements



Assembly is based on information from:

- Technical guidelines (TG)
- Crop database
- 3. Descriptors of most comparative varieties
- 4. Varieties of common knowledge
- 5. Additional teneral registics an agement Institute University of Nairobi

Setting up of the DUS test



- Complete list of varieties to be included:
 - Candidates
 - Comparative varieties with close similarity with candidate
 - Reference varieties varieties of common knowledge
- Seed Enterprises Management Institute
 Seed of the right quality germination, health
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- Proper packaging & labelling of seed

Setting up of the DUS test cont'd



- Set-up/ design of trial determined by:
 - No. of entries
 - No. of plants to observe
 - Observation method
 - Grewing Exclesprises Management Institute
- □ Varieties subjected to same treatment

Setting up of the DUS test cont'd



- Optimal agronomic management
 - supplementary irrigation
 - disease & pest control
 - other stresses managed
- Ensures differences observed are due to genetic tute variations only University of Nairobi

Observations & Data Recording



- DUS data taken from same plants
- Off-types noted and used in determination of uniformity
- Observations made strictly at defined stages

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Analysis & Interpretation



- Analysis with/without statistics depending on:
- Trial layout (randomized vs side-by-side)
- Type of expression of characteristic Qualitative (QL), Pseudo-qualitative (PQ) or Quantitative (QN)
- Method of observation Measurement (M) or visual (V)
- □ Features of Propagation of a Variety nent Institute
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Preparation of DUS Report



- Includes all characteristics used to describe the variety
- Characteristics distinguishing the new variety from similar varieties are highlighted
- Report used:
 - To make a decision on whether or not to grant plant breeders' rights.
 - To make a decision whether the variety should be released for commercialization and included in the national variety list versity of Nairobi
 - As a variety descriptor during seed certification.

Development of National Test Guideline

- UPOV test guidelines used in most cases
- National test guidelines developed for crops without UPOV TGs
- Important characteristics not included in UPOV TGs identified for inclusion in national test guidelines
- Is an ongoing process as application for new crop varieties keep coming.

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Example – Maize DUS



- UPOV Technical guideline applied
- Material required
 - □ 1,500 grains inbred lines
 - 1 kg hybrids and OPVs
 - Meeting minimum requirements for germination, purity, health & moisture content.
 - Not to have undergone dressing that would tute affect expression of characteristics by

Maize DUS



- Method of examination
 - Two independent growing cycles
 - Testing conducted at one place
 - Under conditions ensuring satisfactory growth for expression of relevant characteristics
- Trial population
 - 40 plants inbred lines and single hybrids
 - 60 plants other hybrids and open pollinated varieties
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- At least 2 replicates per trials ity of Nairobi

Maize DUS



Stage of characteristic development

- Indicates the optimum stage of development when that character must be scored
 - Seedling growth
 - Inflorescence emergence
 - Anthesis
 - Milk development
 - Doughedevelopmentrises Management Institute
 - Ripening University of Nairobi

Type of observation



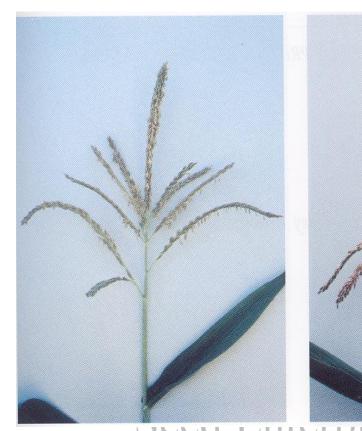
- Expression of characteristics can be observed
 - Visually (V)
 - By measurement (M)
 - Method used depends on the nature of the characteristic and the type of variety, i.e. whether it is an inbred line, single cross, 3-way cross, double cross or open pollinated variety
 (OPV)

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Example, TASSEL:- ATTITUDE OF LATERAL BRANCHES

Time: halfway anthesis

Place: in lower third of tassel



Slightly recurved



Moderately Recurved Strongly recurved

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SCALE

slightly recurved

5 moderately recurved

7 strongly recurved

DUS Testing Staff and Stations

- 15 DUS examiners distributed in 5 stations. Undertake other duties in addition to DUS examination
- There are 5 DUS testing stations, established based on crops and agro-ecological conditions
 - Kisumu Sesame, sorghum, millets, sugarcane
 - Kitale Pasture crops, maize (high altitude)
 - Nakuru Wheat, barley, oats, vegetables
 - Nairobi Legumes, maize (low altitude), root crops Institute
 - Embu Rice, maize (medium altitude)
 - Other crops allocated to suitable locations as applications come

END



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