



**VARIETY TESTING  
DESCRIPTION &  
RELEASE IN KENYA**

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# INTRODUCTION

It's the responsibility of the Government to:-

- Regulate introduction of new plant varieties.
- Maintain an index (National Variety List) of existing plant varieties
- Grant proprietary rights on plant varieties

# INTRODUCTION CONT'

The Government of Kenya through KEPHIS regulates introduction of new plant varieties, through:-

- 1) Conducting tests for Distinctness, Uniformity and Stability (DUS TESTS)
- 2) Conducting National Performance Trials on new crop varieties (NPT TESTS)

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# 1) DUS TESTS

- PURPOSES

- To establish variety identity
- Release of new varieties for commercialization
- Generate descriptor for use in seed certification
- Grant of PBRs
- Variety maintenance

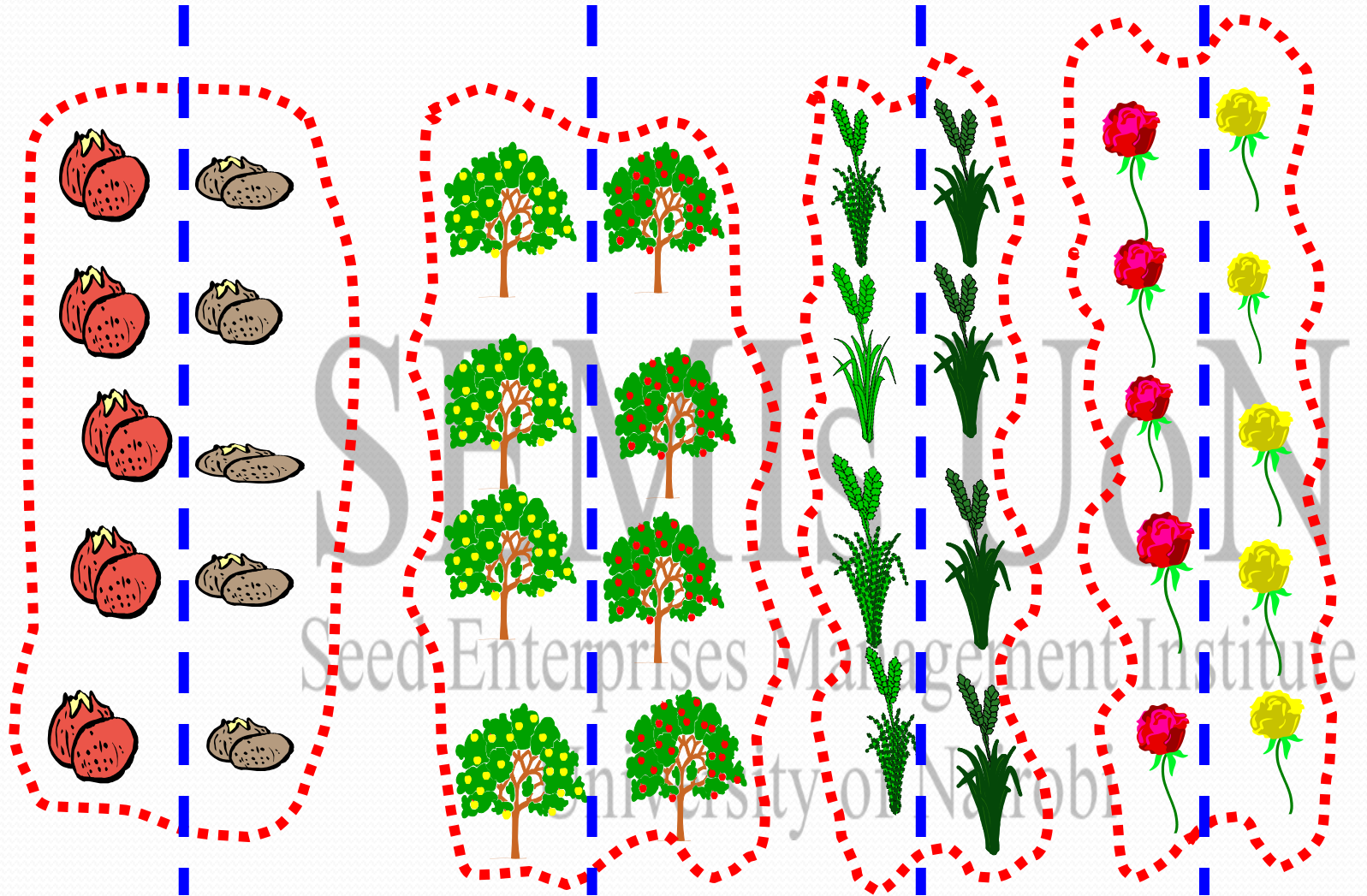
# A variety

- **plant grouping-** lowest known rank
- defined by the expression of the **characteristics resulting from genotype(s)**
- **distinguished** from other plant grouping
- unit suitable for being **propagated unchanged**

# Plant kingdom



# VARIETIES



# Selecting DUS Test Characteristics

- Result from a genotype/combination of genotypes
- Consistent & repeatable
- Capable of precise definition & recognition
- Exhibits sufficient variation/range of expressions
- Allows uniformity & stability requirements to be fulfilled
- Not necessarily have commercial value



# VARIETY DISTINCTNESS

Must be clearly distinguishable from any other variety whose existence is a matter of common knowledge

>>> **CHARACTERISTICS** <<<

which

- *may* have direct *commercial relevance*  
e.g. Flower color (ornamental); Fruit color
- *but commercial relevance NOT* required - often no commercial value  
e.g. Leaf shape

# Fruit color: distinct apple varieties



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itute

## Variety uniformity

Must be *sufficiently* uniform in its relevant

characteristics, *subject to the variation that may*

*be expected from the particular features of its*

*propagation*

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# Non uniform spinach varieties



## Variety stability

Relevant characteristics must remain unchanged

after repeated propagation or, in the case of a

particular cycle of propagation, at the end of each

such cycle

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# Unstable maize varieties



CYCLE I



CYCLE II



CYCLE III

# UPOV Test guidelines in variety Description

## Why UPOV TG?

1. Provides agreed and harmonized approach
  - Various TWP
  - Agreed xters across all UPOV member countries
2. Defines the kind of material to be used e.g Maize TG: inbred lines, hybrids and OPVs
3. Defines quantities of planting materials to be used e.g Maize TG: 1500seeds – inbred lines and 1 kg for hybrids / OPVs

# UPOV TG

## 4. Defines how tests should be conducted:

- Duration 2 growing cycles
- Location of tests
- Optimum growing conditions
- Minimum No. of plants (e.g maize:- 40 plts inbreds & SCH, 80 plts DCH & TWCH)
- No. of replicates

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# UPOV TG

5. Defines critical stages of xter scoring e.g Maize

- **1 – Seedling growth stage:**
  - 12 – 2 leaves unfolded**
  - 14 – 4 leaves unfolded**
- **6 – Anthesis stage:**
  - 61 – Beginning of anthesis**
  - 65 – Halfway anthesis**
- **7 – Milk development**
  - 71 – Grain watery ripe**
  - 75 – Medium milk grain**

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# UPOV TG

6. Defines the part of the plant to be observed e.g Maize:

- Upper ear
- Tassel (middle third of main axis, lower third of tassel)
- Middle third of the ear – type of grain

7. Defines how grouping of varieties should be done

- Xters known not to vary or vary slightly within a variety e.g in maize

-Tassel: Time of anthesis

- Ear: Anth. Col. Silks

- Ear: Type of grain

- Ear: Anth. Col. Of glumes of cob

# UPOV TG

## 8. Indicates state of expression

- Given to each xter
- To define the xter
- To harmonize the description

## 9. Indicates type of the state of expression of xters

- Qualitative (QL)
- Pseudo-qualitative (PQ)
- Quantitative (QN)

# Qualitative (QL)

- Expressed in discontinuous states e.g. sex, plant growth type (dwarf or climbing)
- Score of 1 or 9
- States self-explanatory & independently meaningful
- Not influenced by environment

# Quantitative (QN)

- Expressed in continuous states
- States cover full range of variations from one extreme to the other
- Expression recorded in one-dimensional, continuous or discrete, linear scale
- Range of expression divided into number of states e.g. very short (1), short (3), medium (5), tall (7), very tall (9)

# Pseudo-Qualitative (PQ)

- Range of variation partly continuous
- But varies in more than one dimension e.g. shape (ovate (1), elliptic (2), circular (3), obovate (4))

# UPOV TG

10. Indicates numerical notes allocated to each state of expression

- for ease of recording of data
- For statistical data analysis
- For production & exchange of the description

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# UPOV TG

## 11. Indicates method of observation

- Expression of characteristics can be observed

(i) Visually (V)

(ii) by Measurement (M)

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# Visual observation (V)

- VG - single observation of a group of plants or part of plants
- VS – individual plant or plant parts observation
- Based on examiner's judgment
- Includes smell, taste, touch
- Faster, cheaper of measurement
- But requires adequate training & experience of examiner

# Visual observation (V) cont'

- May involve reference aids e.g.
  - diagrams
  - side-by-side comparisons
  - example varieties
  - color charts, etc

# Measurement (M)

- MG – Single measurement for a group of plants or part of the plants
- MS – Individual plant or part of plant measurement
- Objective observation based on a calibrated, linear scale e.g.
  - ruler
  - weighing scale
  - counts
  - dates, etc

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# Choosing Method of Observation

- Depends on:

## 1. Type of characteristic

- QL, PQ – generally observed visually
- QN – measured or visually observed

## 2. Available resources

- V is faster but M more precise

# Choosing Method of Observation cont'

## 3. Variability between & within varieties

- Very little variation e.g. VP & SP – visual assessment
- Larger variation i.e. CP & SYN varieties, especially in QN and PQ – measurements

# UPOV TG

12. V Provides basis for making a decision e.g  
uniformity requirement in maize inbreds and sch 3  
offtypes/40 plants

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# DUS Examiner

- Requires adequate training to ensure that observations are:

- Accurate

- Consistent

- Repeatable

*Pillars of DUS*

*Examination*

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## 2) NPT TESTS

### PURPOSES

- To determine their adaptability
- To determine value for cultivation and use (VCU)
- For the purposes of release for commercialisation

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# LEGAL FRAMEWORK FOR CONDUCTING NPT

- Regulations Finalised and gazetted in the supplementary issue of the Kenya Gazette of December 2016
- Cited as “ The Seeds and Plant Varieties (Variety Evaluation and Release) Regulations, December 2016

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# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

- 1) Defines the application criteria for performance trials
  - Varieties of crops to undergo performance trial
  - Application requirements (seeds, fees, forms etc)
  - Deadlines for submission of Planting materials
  
- 2) Sets the National Performance Trials Committee (NPTC) consisting of :-
  - Managing Director (KEPHIS), As the chairperson and provide secretariat services
  - 1 rep from Ministry of Agriculture
  - 1 rep from Seed Trade Association of Kenya
  - 2 reps from Plant Breeders Association of Kenya
  - Not more than 6 crop specialists co-opted by MD - KEPHIS

# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

## Functions of the NPTC

- Oversee the conduct of performance trials
- Review performance trials protocols, guidelines and minimum number of candidate varieties to constitute a performance trial
- Evaluate performance trials report & make recommendations to the release committee
- Review applications for performance trials
- Provide feedback to the applicants on performance of their entries in the performance trials
- Develop rules for the conduct of meetings
- Invite applicants who had candidate plant varieties in the trials to attend trials committee meetings

# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

- 3) Defines the testing periods for the performance trials
  - At least two seasons for all varieties
  - One season for a variety officially released in any of the East African countries provided the applicant provide release data
  
- 4) Gives guidelines on Trials Management by KEPHIS
  - Ensuring appropriate site selection, timely planting and proper management according to the protocols and manuals on each crop including records of various activities
  - Upon giving adequate notice, organize an evaluation visit for applicants to trial sites for the purpose of evaluating the conduct of the trials and performance of the varieties
  - Ensure proper data collection and analysis from all performance trials sites and compilation of the final report

# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

- Send the draft report to the members of the trials committee and the applicants with candidate varieties at least 14 days before the Trials Committee meeting
- Convene a Trials committee meeting to evaluate and make summary report to the release committee
- Ensure confidentiality of all materials and information provided by the applicant under these regulations

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# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

5) Sets the of National Variety Release Committee (NVRC) comprising of :

- The Head of Directorate in charge of crops, Ministry of Agriculture, Livestock and Fisheries – The chairperson
- Managing Director , KEPHIS – The Secretary
- The Head of Division responsible for Agricultural advisory Services, Ministry of Agriculture

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# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

- The Chair, Seed Trade Association of Kenya or His representative.
- The Chairman, The Plant Breeders Association of Kenya
- 1 rep from Higher academic institution offering training in seed science and technology to be nominated at the first sitting of the committee.
- The CEO, Kenya National Agricultural Farmers' Federation

# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

## Functions of the NVRC

- Consider the report of the NPTC and its recommendations
- Consider the DUS report
- Approve and release qualifying varieties
- Determine fees for any application under these regulations
- Moderate on any disputes relating to these regulations
- Provide advice on policies and procedures on performance trials

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# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

- Prepare a list of approved and released Plant varieties and forward it to KEPHIS for gazettment
- Determine the procedures for withdrawal of released plant varieties
- Determine the nomenclature to be applied to new varieties
- Invite applicants of successful candidate plant varieties to attend variety release meeting

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# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

- 6) Gives provision for Maintenance of an index (National Variety List) of existing plant varieties & updating by KEPHIS
  - KEPHIS to publish the names of the released varieties in the Gazette within 21 days of the Release Committee
  - KEPHIS to update and publish the National Variety List annually in the Gazette
  - KEPHIS to maintain a Register of all applications for performance trials and any exemptions granted

# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

7) Sets guidelines for official Release of a Variety

- A process whereby a plant variety listed under the second schedule has satisfactorily :-
  1. Undergone National performance trial & Proved to be superior to commercial checks in terms of yield or other special attribute(s)
  2. Proven to be Distinct, uniform and stable

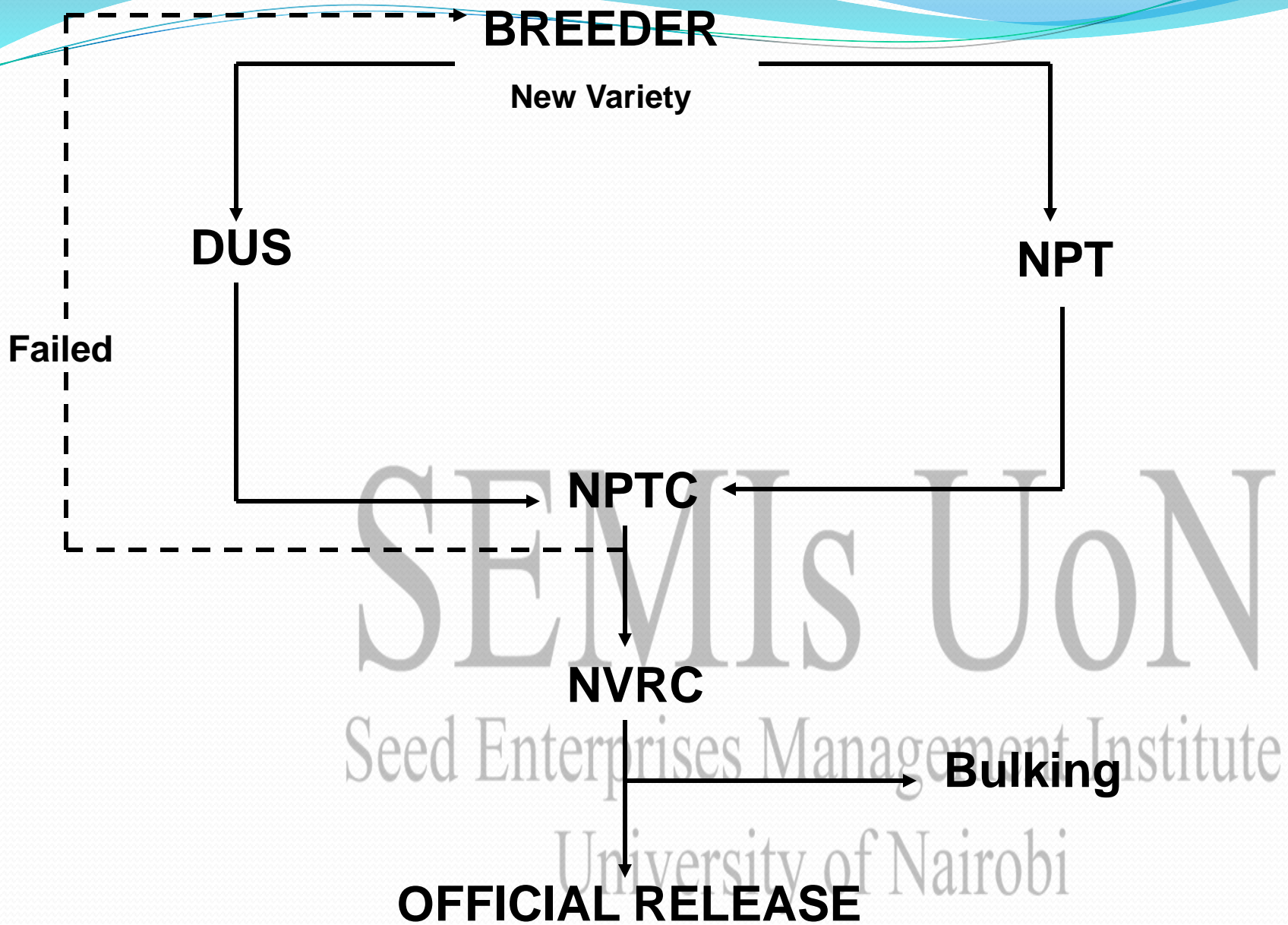
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# LEGAL FRAMEWORK FOR CONDUCTING NPT CONT'

- 3) Valid descriptor for seed certification
  - 4) Been approved for release by the NVRC
- Once a variety has been officially released, its gazetted and entered in the National Variety List
  - National Variety list – List of varieties approved and gazetted for commercialization

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END

*Thank You*

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