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UPOV

**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**

GENEVA

# TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

## Twenty-Sixth Session
## Jeju, Republic of Korea, September 2 to 5, 2008

DATA PROCESSING FOR (MEASUREMENTS OF) QUANTITATIVE CHARACTERISTICS IN SELF-POLLINATED CROPS FOR THE ASSESSMENT OF DISTINCTNESS AND VARIETY DESCRIPTION

*Document prepared by experts from Germany*

# Data processing for (measurements of) quantitative characteristics in self-pollinated crops for the assessment of distinctness and variety description

U. Meyer
Bundessortenamt Hannover
Germany





# Approaches for assessing distinctness UPOV – TGP/9 section 5.2

- Side by side
- Notes
- Statistical analysis

## Approach to get notes

For the assessment of distinctness and the description of varieties it is important to consider:

1. How many varieties are in the trial?
2. Do these varieties represent the whole variation of the known varieties or only a part of it?





## Approach to get notes

3. What is the smallest appropriate difference between two varieties which can be considered to be clear and consistent for a characteristic?

4. How many notes are reasonable to describe the range over all varieties in the trial and in the whole collection?

## Approach to get notes

5. Do you need measurements or are visual assessments sufficient?

6. In the case of measurements, is it possible to observe the characteristic on a group of plants (MG) or is it necessary to measure single plants (MS)?





## Approach to get notes

It is important to answer these questions in the presented order!!

## Decision rule (General Introduction)

For quantitative characteristics, a difference of two notes often represents a clear difference, but that is not an absolute standard…

Depending on factors,…., a clear difference may be more or less than two notes.





## Example

Barley (Winter barley)
Hordeum vulgare L. sensu lato
UPOV – Code: HORDE_VUL

## Table of characteristics (measurements)

**Barley**

| | | |
|---|---|---|
| Plant: | length | MG |
| Awn: | length (compared to ear) | MS |
| Ear: | length | MS |
| Rachis: | length of first segment | MS |





## Example: Plant length

Measurements in cm (MG)

Notes for description:

| | |
|---|---|
| 1 | very short |
| 3 | short |
| 5 | medium |
| 7 | long |
| 9 | very long |

# Method of observation

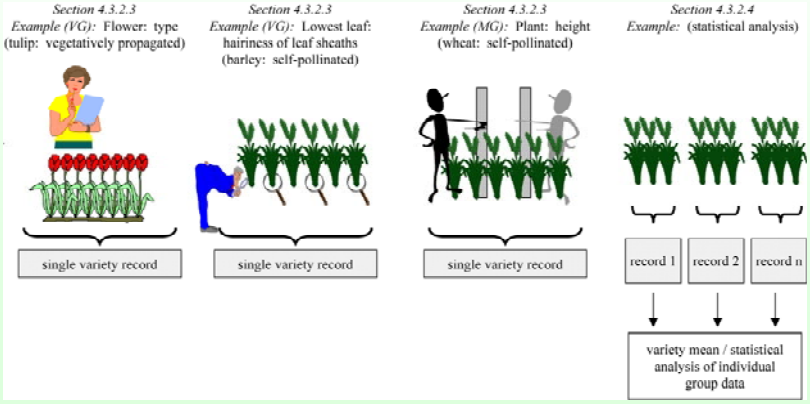
MG: Single Measurement of a group of plants or part of plants for the assessment of distinctness

MS: Measurement of a number of individual plants or part of plants for the assessment of distinctness

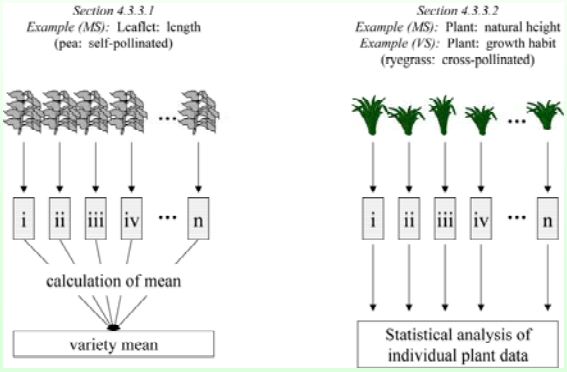




# TGP/9/1
## Single record for a group of plants or part of plants (G)



# TGP/9/1
# Records for a number of single, individual plants or part of plants (S)








# Over - determination

Statistical analysis on the basis of MS or on the basis of replicated MG for self-pollinated crops could leads to a so-called over-determination:

- too small differences could be declared as significant
- the direction of the difference could be different over years

# Over - determination

Crop expert has to decide whether a minimum distance calculated by statistical procedures is appropriate to be considered as a clear difference





# Fixing of states of expressions (Barley)

**Char.: Plant length**

- 241 varieties (146 registered varieties)
  One record per variety
- mean of all varieties 90 cm
- **Mean of registered varieties** 89 cm

**shortest variety** **75 cm**
**longest variety** **105 cm**

**105 cm**
**- 75 cm**

**30 cm / 5 = 6 cm → width of states**

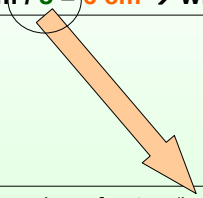
**States**

| | from | to |
|---|---|---|
| • 1 | | ≤ 69 cm |
| • 2 | > 69 | ≤ 75 cm |
| • **3** | > **75** | ≤ 81 cm |
| • **4** | > 81 | ≤ 87 cm |
| • **5** | > 87 | ≤ 93 cm |
| • **6** | > 93 | ≤ 99 cm |
| • **7** | > 99 | ≤ **105 cm** |
| • 8 | > 105 | ≤ 111 cm |
| • 9 | > 111 cm | |

# Fixing of states of expressions (Barley)

**Char.: Plant length**

**30 cm / 5 = 6 cm → width of states**



The number of notes (here 5) has to be defined by the crop expert according to questions 3 and 4 (see slide 4)

3. What is the smallest appropriate difference …?

4. How many notes are reasonable to describe the range …?





Thank you for your attention!



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