



TC/49/29

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DATE: February 8, 2013

# INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

## TECHNICAL COMMITTEE

### Forty-Ninth Session Geneva, March 18 to 20, 2013

REVISION OF DOCUMENT TGP/8: PART II: TECHNIQUES USED IN DUS EXAMINATION,  
NEW SECTION: DATA PROCESSING FOR THE ASSESSMENT OF DISTINCTNESS AND FOR  
PRODUCING VARIETY DESCRIPTIONS

*Document prepared by the Office of the Union*

1. The purpose of this document is to present the developments concerning a possible new section for document TGP/8: "Data Processing for the Assessment of Distinctness and for Producing Variety Descriptions".

2. The following abbreviations are used in this document:

CAJ:	Administrative and Legal Committee
TC:	Technical Committee
TC-EDC:	Enlarged Editorial Committee
TWA:	Technical Working Party for Agricultural Crops
TWC:	Technical Working Party on Automation and Computer Programs
TWF:	Technical Working Party for Fruit Crops
TWO:	Technical Working Party for Ornamental Plants and Forest Trees
TWV:	Technical Working Party for Vegetables
TWPs:	Technical Working Parties

3. The structure of this document is as follows:

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## BACKGROUND

4. The Technical Committee (TC), at its forty-eighth session, held in Geneva from March 26 to 28, 2012, considered Annex III: "TGP/8 PART I: DUS Trial Design and data analysis, New Section 6 – Data processing for the assessment of distinctness and for producing variety Descriptions" in conjunction with Annex VIII: "TGP/8 PART II: Techniques used in DUS Examination, New Section 13 - Methods for data processing for the assessment of distinctness and for producing variety descriptions" of document TC/48/19 Rev. It agreed that the information provided in Annex VIII of document TC/48/19 Rev. and at the UPOV DUS Seminar, held in Geneva in March 2010, together with the method provided by Japan and the method used in France for producing variety descriptions for herbage crops, as presented at the TWC at its twenty-sixth session (see document TWC/26/15, TWC/26/15 Add. and TWC/26/24), provided a very important first step in developing common guidance on data processing for the assessment of distinctness and for producing variety descriptions, but concluded that the information as presented in Annex VIII of document TC/48/19 Rev. would not be appropriate for inclusion in document TGP/8. It agreed that the Office of the Union should summarize the different approaches set out in Annex VIII of document TC/48/19 Rev. with regard to aspects in common and aspects where there was divergence. As a next step, on the basis of that summary, consideration could be given to developing general guidance. The TC agreed that the section should include examples to cover the range of variation of characteristics. It further agreed that the detailed information on the methods should be made available via the UPOV website, with references in document TGP/8 (see document TC/48/22 "Report on Conclusions" paragraph 52).

## COMMENTS OF THE TECHNICAL WORKING PARTIES (TWPS) IN 2012

5. At their sessions in 2012, the TWA, TWV, TWC, TWF and the TWO, considered documents TWA/41/30, TWV/46/30, TWC/30/30, TWF/43/30 and TWO/45/30 respectively, as set out in Annex to this document (in English only\*).

6. The TWPs, at their sessions in 2012, made the following comments:

General	The TWA noted the information that a summary of different approaches used for data processing for the assessment of distinctness and for producing variety descriptions would be developed by the Office of the Union (see document TWA/41/34 "Report", paragraph 44).	TWA
	The TWV considered document TWV/46/30 and received a presentation made by the Office containing a summary of different approaches for transforming means into notes for variety descriptions. The TWV was informed that the summary would be presented to the TWC at its thirtieth session and that it would be further developed (see document TWV/46/41 "Report", paragraphs 43 and 44).	TWV
	The TWC noted information provided in documents TWC/30/30 and TWC/30/30 Add. and agreed that the experts from Finland, Italy and the United Kingdom would support the Office of the Union to summarize the different approaches for further developing common guidance on data processing for the assessment of distinctness and for producing variety descriptions (see document TWC/30/41 "Report", paragraph 42).  The TWC agreed that experts from the United Kingdom in cooperation with experts from France and Germany should conduct a practical exercise. The exercise would be to process a common data set to produce variety descriptions in order to determine the aspects in common and where there was divergence among the methods (see document TWC/30/41 "Report", paragraph 43).	TWC
	The TWF considered documents TWF/43/30 and TWF/43/30 Add. and received a presentation made by the Office containing a summary of different approaches for transforming means into notes for variety descriptions.	TWF

\* The TC-EDC, at its meeting on January 9 and 10, 2013, agreed that it would not be appropriate to translate the text for the forty-ninth session of the TC.

	<p>The TWF expressed concern that a specific country may have difficulty in describing the full range of states of expression of a characteristic because some varieties might not be available. A universal set of example varieties, the use of historical data and experience of the experts could be a way to address this issue.</p> <p>The TWF recommended that consideration be given to the construction of a meaningful range of expression in the case of a limited range of available varieties. (see document TWF/43/38 "Report", paragraphs 29 to 31)</p>	
	<p>The TWO agreed with the recommendations of the TWF that consideration be given to the construction of a meaningful scale of expression in the case of a limited range of available example varieties (see document TWO/45/37 "Report", paragraph 32).</p>	<p>TWO</p>

7. In accordance with the proposal of the TWC, the Office of the Union has invited experts from the United Kingdom, France and Germany to make a proposal for a practical exercise.

#### COMMENTS OF THE ENLARGED EDITORIAL COMMITTEE (TC-EDC) IN 2013

8. The TC-EDC, at its meeting held in Geneva on January 9 and 10, 2013, considered document TC-EDC/Jan 13/16: "Revision of document TGP/8: Part II: Techniques Used in DUS Examination, New Section: Data Processing for the Assessment of Distinctness and for Producing Variety Descriptions".

9. The TC-EDC, agreed that it would be necessary for the experts from the United Kingdom, France and Germany to provide a common test data set of self-pollinated and/or vegetatively propagated varieties for performing a practical exercise, because the COY method was already well established for cross-pollinated varieties.

10. The Chairperson of the TWC offered to provide variety descriptions from Finland.

11. *The TC is invited to:*

*(a) consider the comments made by the TWPs at their sessions in 2012; and*

*(b) request the experts from the United Kingdom, France and Germany to provide a common data set of self-pollinated and/or vegetatively propagated varieties for performing a practical exercise.*

[Annex follows]

Technical Working Party on  
Automation and Computer Programs

Thirtieth Session

**TRANSFORMATION OF  
MEASUREMENTS INTO NOTES FOR  
VARIETY DESCRIPTIONS**

SUMMARY OF DIFFERENT APPROACHES

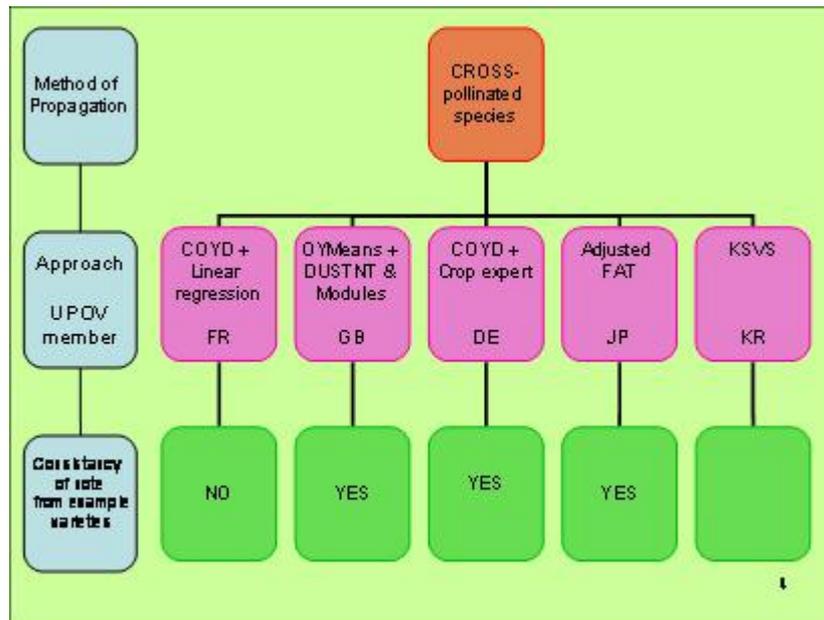
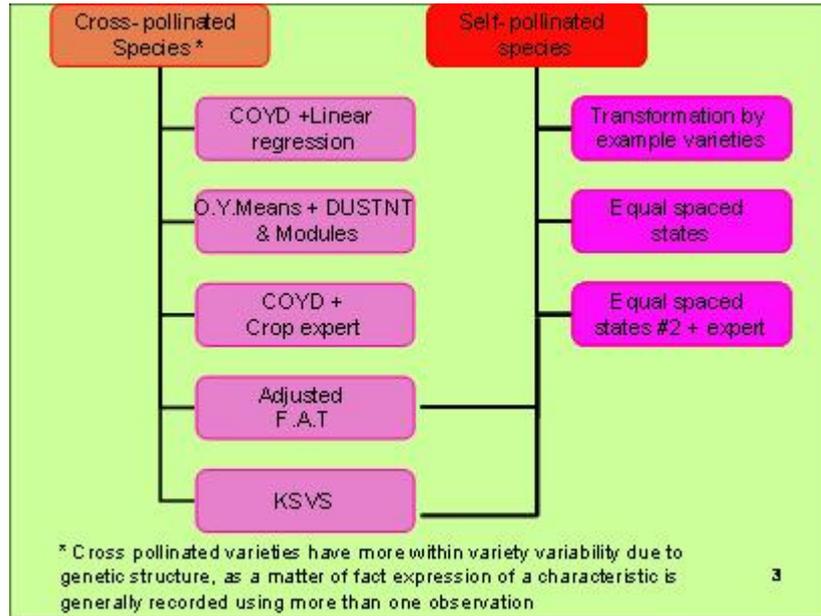
Chisinau, Republic of Moldova  
June 26 to 29, 2012

1

**OVERVIEW/ CONTEXT/ BACKGROUND**

- In order to produce a summary of different approaches on data processing  
(see document TC/48/22 "Report on conclusions", paragraph 52)
- For transforming means into notes
- For Quantitative (QN) characteristics recorded by measurements (M)
- In order to develop a common guidance and harmonized processes

2



## COYD + Linear regression <France>

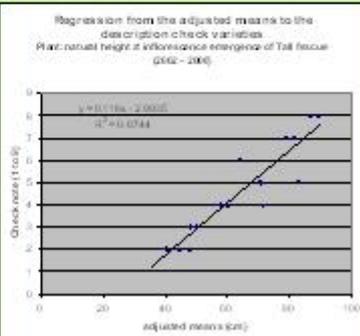
Use of COYD that provides adjusted means for each characteristics for example varieties & candidate varieties

Transformation into notes by using linear regression (generate a formula) in order to provide the predicted note based on the adjusted mean

Example: Festuca / Grass



Regression from the adjusted means to the description of the variables  
Plot: current height at inflorescence emergence of Tall fescue (2002 - 2005)



## Means + DUSTNT software <United Kingdom>

Using over year variety means are calculated on the original scale of characteristics (DUSTNT module FITC in conjunction with module FIND)

Transformations into notes by using DUSTNT module VDES by use of delineating varieties to divide the range into states

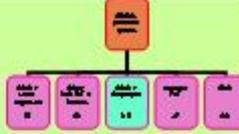
DUSTNT module SAME + MOST+ SSQR + DIST

Example: Herbage crops

Figure 1. Example illustrating how Variety Descriptors are derived in Herbage crops using delineating varieties in United Kingdom

Reference variety	Yearly means										Over-year mean	State
	1	2	3	4	5	6	7	8	9	10		
001	*	*	*	22.44	23.98	25.40	22.83	23.71	25.79	22.23	23.95	1
002	*	*	*	23.36	22.86	25.86	21.39	24.23	19.49	23.27	23.05	1
003	*	*	*	*	*	22.28	21.95	24.57	20.13	23.14	22.2	2
004	19.77	22.05	22.17	25.23	23.46	26.57	22.47	23.95	21.80	23.55	23.32	2
005	20.18	22.13	22.74	19.74	21.74	23.67	23.60	25.25	11.71	24.55	23.64	2
006	*	*	*	18.68	23.00	22.78	23.02	22.38	24.25	23.62	2	
007	*	*	*	*	*	21.47	20.93	18.60	23.67	25.24	21.98	1
008	*	*	20.00	24.92	24.97	23.01	24.95	26.03	22.21	25.89	24.34	2
009	*	24.33	25.42	24.10	25.73	23.73	24.74	26.19	23.59	25.90	24.98	2
010	*	*	*	*	*	22.22	24.83	26.26	25.14	25.96	24.72	2
011	*	*	*	*	*	25.35	27.77	24.80	27.11	25.81	4	
012	25.13	27.98	28.57	27.00	27.46	26.42	28.52	27.48	27.30	27.27	4	
013	*	*	*	*	28.34	28.20	27.60	30.01	28.63	28.41	27.71	4
014	26.77	27.48	28.85	28.90	29.32	28.78	29.22	29.75	27.87	28.00	36.50	5
015	*	*	*	*	29.45	28.4	30.34	29.80	27.45	28.5	28.99	5
016	*	*	*	*	*	*	*	27.93	27.65	27.36	27.57	2
017	*	*	*	*	*	*	*	24.69	22.25	23.17	23.01	2

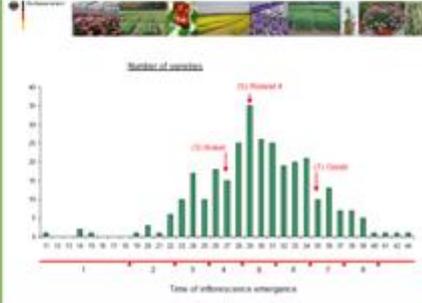
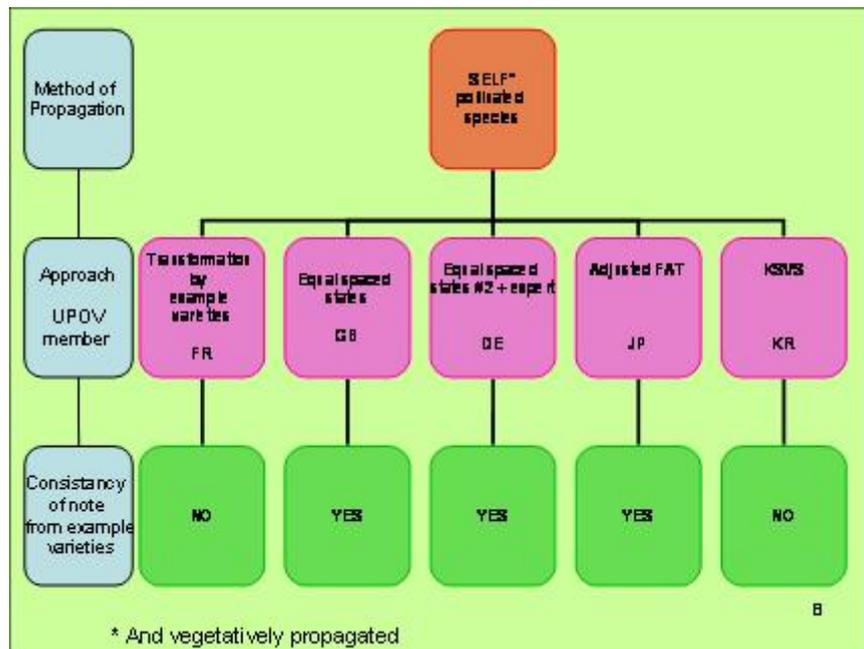
## COYD + crop expert <Germany>



Use of COYD that provides adjusted means for each characteristics for example varieties & candidate varieties

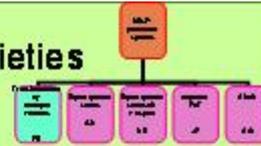
Transformation into notes according to example varieties & crop expert judgement

Example: Festuca / Grass

## Transformation by example varieties

<France>



Adjustment on the basis of example varieties

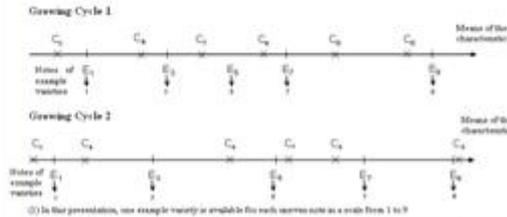
Values are distributed on a axis with example (EV) & candidates varieties

Transformation into notes are given in relation to the EV in each growing cycle

Distribution on the axis of the Candidate is made in relation to the Example varieties and the corresponding notes

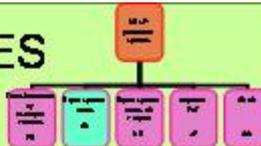
No clear example

Figure 1: collection of measured data on one quantitative characteristic for 5 candidate varieties (C<sub>1</sub> to C<sub>5</sub>) and a set of 5 example varieties (E<sub>1</sub> to E<sub>5</sub>) during 2 growing cycles



## Means + DUSTNT + VDES

<United Kingdom>



Division of the range of expression of the over-year means for the reference collection varieties into equal spaced states

Transformations into notes by using DUSTNT module VDES by division of the range into equal spaced states

Range of notes can be expanded from a 5 to 9 scale

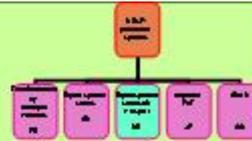
Example: Pea

Figure 2: Example illustrating how Variety Descriptors are developed in Peas by division of the range of expression into equal spaced states in United Kingdom

Reference variety	Yearly means									Over-year mean	Note
	1	2	3	4	5	6	7	8	9		
R1	*	*	*	*	*	21	30	22	24	20.8	3
R2	*	*	*	29	39	27	39	26	26	30.4	3
R3	*	38	65	89	45	44	59	56	25	54.7	4
R4	72	91	73	45	59	52	69	56	57	59.9	4
R5	*	*	*	*	*	66	70	58	60	66.4	4
R7	*	*	71	81	73	72	65	54	51	72.2	4
R8	*	*	*	*	86	107	102	91	91	102.7	6
R9	121	126	113	79	117	102	109	106	79	104.7	6
R10	*	97	112	85	124	110	117	112	88	106.7	6
R11	*	*	*	122	121	129	105	102	85	117.7	7
R12	*	*	*	*	115	130	129	106	97	114.6	7
R13	*	*	*	*	122	132	130	112	121.2	7	
R15	*	*	*	*	121	105	107	106	126.6	7	
Candidate variety											
C1	*	*	*	*	*	*	55	32	37	41.3	3
C2	*	*	*	*	*	*	55	38	25	41.2	3
C3	*	*	*	*	*	*	49	44	55.7	4	



## Equal spaced states #2 <Germany>



Division of the range of expression of the over-year means for the reference collection varieties into equal spaced states

Adjustment of notes is done by reference to example varieties

Range of variation can be adjusted (expert judgement)

Example: Barley

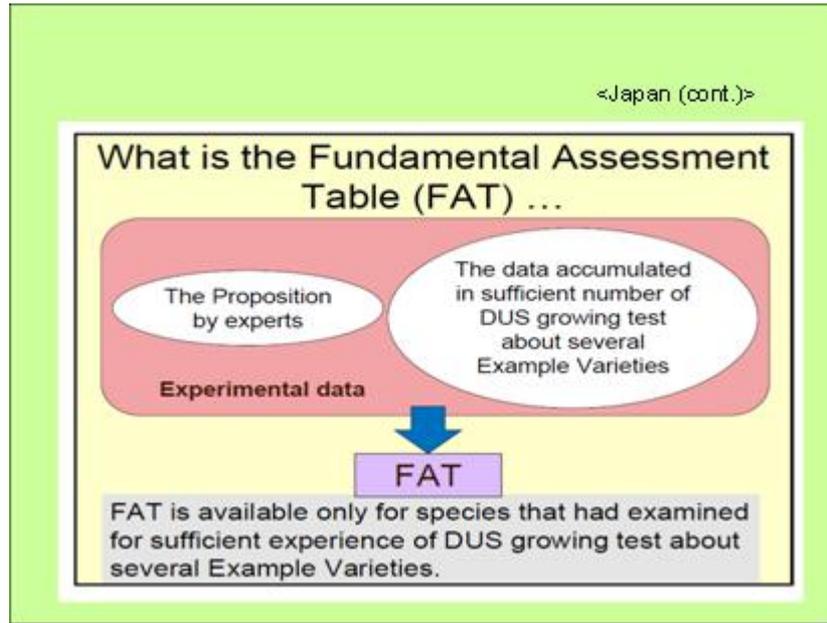


- Range 38.3 cm / 7 Notes = 5.5 cm width of states

State	from	to	Example varieties
1		≤ 87.4	
2	> 87.4	≤ 92.8	
3	> 92.8	≤ 98.3	3 – Spectrum (93.8)
4	> 98.3	≤ 103.8	
5	> 103.8	≤ 109.2	5 – Rani (111.0)
6	> 109.2	≤ 114.7	
7	> 114.7	≤ 120.2	7 – Stephanie (118.6)
8	> 120.2	≤ 125.7	
9	> 125.7		

## Adjusted Full Assessment Table (FAT) <Japan>

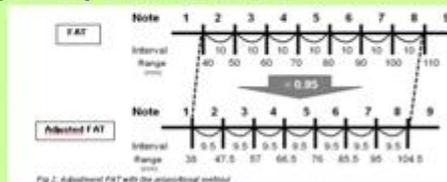
- FAT is a table to evaluate the notes from the datas of QN characteristics
- The notes are based on example variety's data from ONE growing trial + historical datas
- (Mainly use for ornamental & veg. crops)
- Same method for self and cross,
- The adjustable range changes according to dispersion of Historical data of the Example variety



## FAT proportional method

<Japan (cont.)>

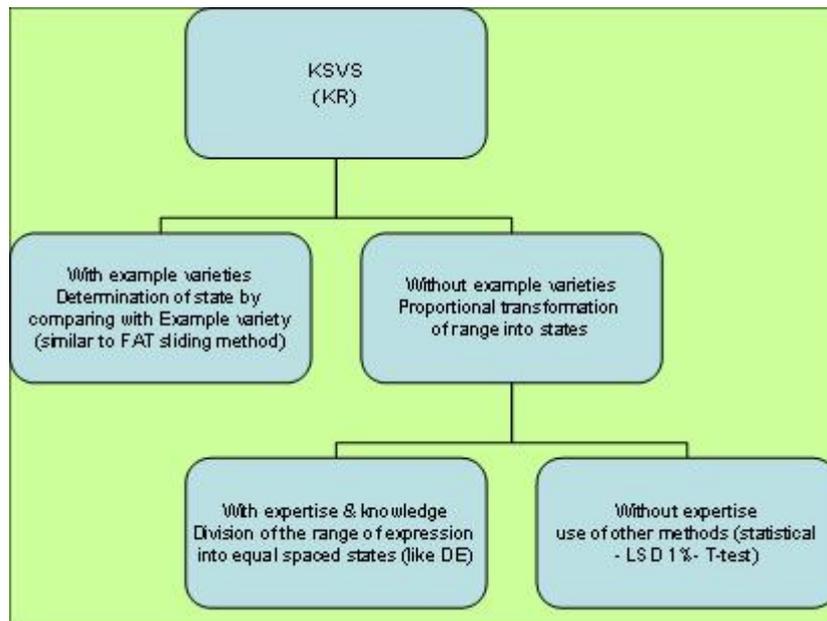
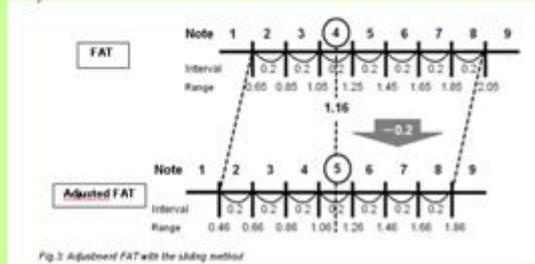
- **Range & interval of notes are adjusted once**
- **Calculate by the proportion of the measured data to Mean of the historical data about Example Varieties.**
- **The interval of notes is adjusted accordingly in equal spaced states**



## FAT Sliding method

<Japan (cont.)>

- Range is adjusted- interval is not changed
- Calculate by the subtraction of Mean of the historical data from the measured data about Example Varieties (EV).
- Adjustment based on the least variable EV



## NEXT STEPS

- **Check if summary is correct**
- **Check how the stability of descriptions of reference varieties is representative and stable over years**