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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

Thirtieth Session

Chisinau, Republic of Moldova, June 26 to 29, 2012

ADDENDUM

TRANSFORMATION OF MEASUREMENTS INTO NOTES FOR VARIETY DESCRIPTIONS: SUMMARY OF DIFFERENT APPROACHES

Document prepared by the Office of the Union

1. The Technical Committee (TC), at its forty-eighth session, held in Geneva from March 26 to 28, 2012, considered the revision of document TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability" on the basis of document TC/48/19 Rev. It also agreed that the Office of the Union should summarize the different approaches set out in Annex VIII to 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 (see document TC/48/22 "Report on Conclusions", paragraphs 49 and 52).

2. Annex to this document contains a summary of different approaches used for data processing for the assessment of distinctness and for producing variety descriptions, which will be presented by the Office of Union at the Technical Working Party on Automation and Computer Programs (TWC) at its thirtieth session.

[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

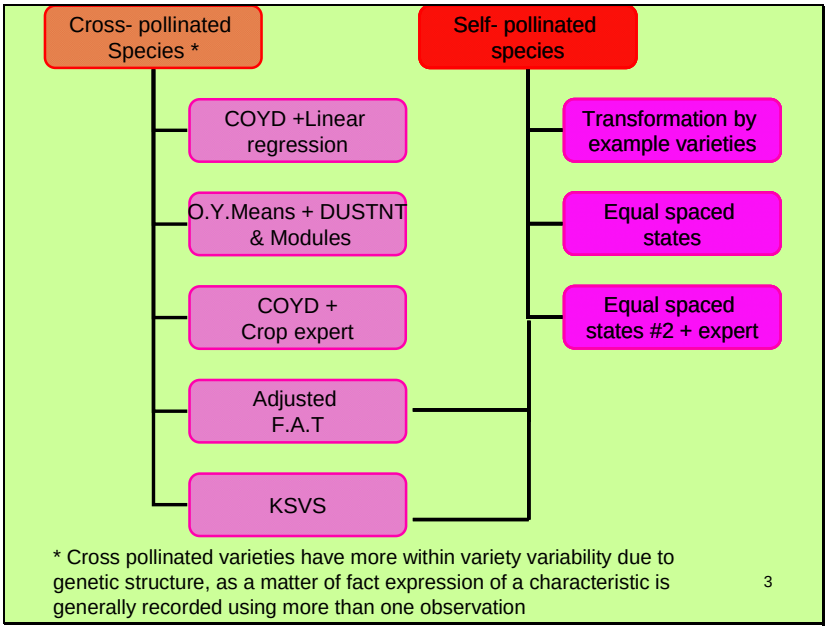
OVERVIEW/ CONTEXT/ BACKGROUND

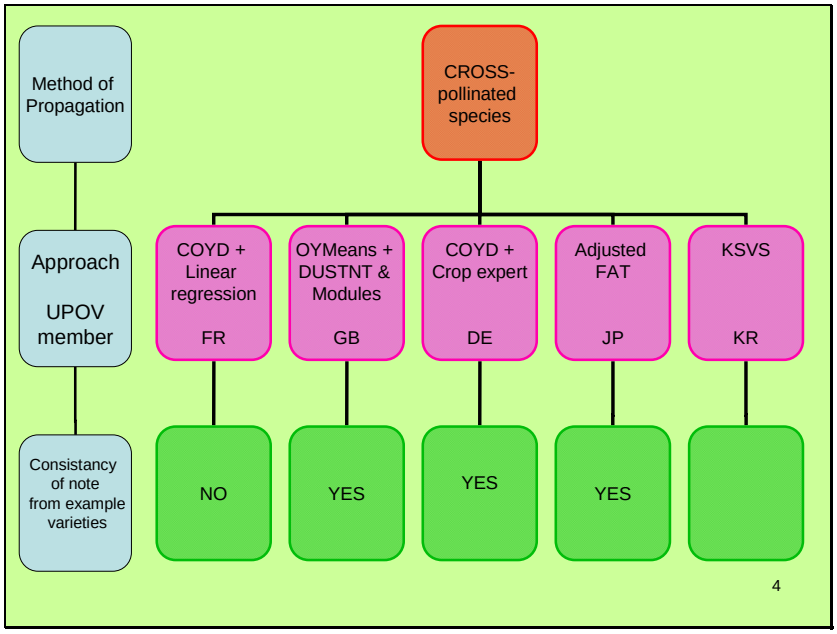
- In order to produce a summary of different approaches on data processing

  (see document TC/48/22 "Report on conclusions", paragraph 52)

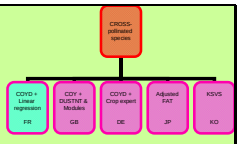
- For transforming means into notes
- For Quantitative (QN) characteristics recorded by measurements (M)
- In order to develop a common guidance and harmonized processes

2


Cross- pollinated Species *
Self- pollinated species
COYD +Linear regression
O.Y.Means + DUSTNT & Modules
COYD + Crop expert
Adjusted F.A.T
KSVS
Transformation by example varieties
Equal spaced states
Equal spaced states #2 + expert
* Cross pollinated varieties have more within variety variability due to genetic structure, as a matter of fact expression of a characteristic is generally recorded using more than one observation
3


Method of Propagation
Approach
UPOV member
Consistancy of note from example varieties
CROSS-pollinated species
COYD + Linear regression
FR
OYMeans + DUSTNT & Modules
GB
COYD + Crop expert
DE
Adjusted FAT
JP
KSVS
KR
NO
YES
YES
YES
4

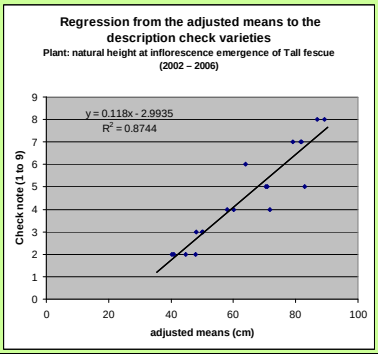
COYD + Linear regression <France>



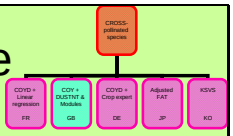
Use of COYD that provides adjusted means for each characteristics for example varieties & candidate varieties

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



Means + DUSTNT software <United Kingdom>



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

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

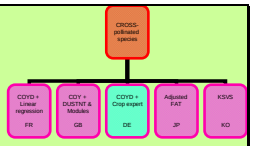
DUSTNT module SAME + MOST+ SSQR + DIST

Example: Herbage crops

Figure 1: Example illustrating how Variety Descriptions are developed in Herbage crops using delineating varieties in United Kingdom

Reference variety	Yearly means 1	2	3	4	5	6	7	8	9	10	Over-year mean	Note
R1	*	*	*	22.44	23.09	20.40	22.83	23.71	20.79	22.33	21.95	1
R2	*	*	*	23.36	22.89	21.65	21.39	24.23	19.49	23.27	**22.05**	1
R3	*	*	*	*	*	22.26	21.35	24.57	20.13	23.14	22.2	2
R4	19.77	22.05	22.17	25.33	21.84	20.57	22.67	23.55	21.80	23.55	22.32	2
R5	21.15	23.13	23.75	24.74	23.74	23.67	23.80	25.25	21.71	24.55	**23.55**	3
R6	*	*	*	*	24.64	23.00	23.76	25.02	22.16	24.25	23.62	3
R7	*	*	*	*	*	21.47	25.93	24.65	23.07	25.24	23.98	3
R8	*	*	25.00	24.92	24.97	23.51	24.55	26.03	22.31	25.89	24.34	3
R9	*	24.33	25.43	24.18	25.73	23.13	24.74	26.19	23.59	25.90	24.56	3
R10	*	*	*	*	*	22.22	24.82	26.28	25.14	25.56	**24.72**	3
R11	*	*	*	*	*	*	25.35	27.77	24.60	27.11	25.83	4
R12	25.13	27.58	28.57	27.01	27.98	25.42	28.62	27.88	27.30	27.27	27.27	4
R13	*	*	*	*	28.34	26.31	27.68	30.01	26.63	28.41	27.71	4
R14	26.77	27.49	28.65	28.90	29.33	28.19	28.22	29.76	27.91	28.00	**28.32**	5
R15	*	*	*	*	29.48	28.4	30.34	29.85	27.48	29.5	28.99	5
Candidate variety												
C1	*	*	*	*	*	*	*	22.93	22.65	23.36	22.57	2
C2	*	*	*	*	*	*	*	24.84	22.25	23.17	23.01	2

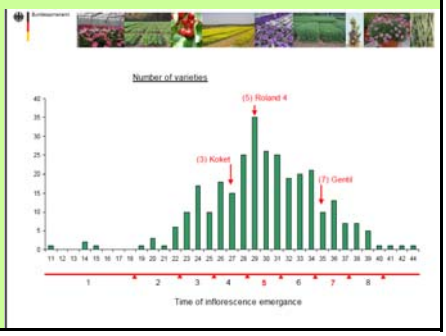
COYD + crop expert <Germany>

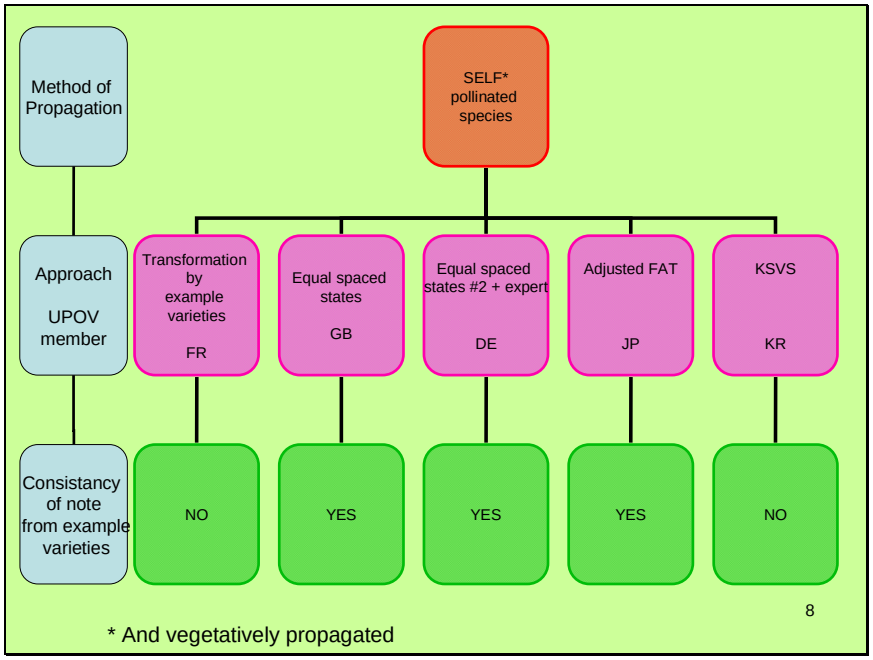


Use of COYD that provides adjusted means for each characteristics for example varieties & candidate varieties

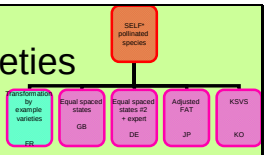
Transformation into notes according to example varieties & crop expert judgement

Example: Festuca / Grass





Transformation by example varieties <France>



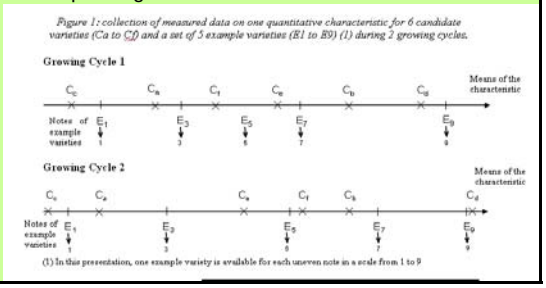
Adjustment on the basis of example varieties

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

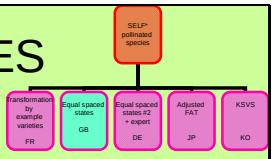
Transformation into notes are given in relation to the EV in each growing cycle

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

No clear example



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

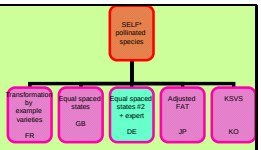
Range of notes can be expanded from a 5 to 9 scale

Example: Pea

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

Reference variety	Yearly means 1	2	3	4	5	6	7	8	9	Over-year mean	Note
R1	*	*	*	*	*	21	36	22	24	30.0	3
R2	*	*	*	29	39	29	39	25	28	35.4	3
R3	*	55	65	68	48	44	59	56	28	54.7	4
R4	72	61	73	45	59	52	68	56	53	59.9	4
R5	*	*	*	*	*	68	70	58	60	68.4	4
R7	*	*	77	61	73	72	80	64	61	72.2	4
R8	*	*	*	*	96	107	102	101	91	102.7	6
R9	121	120	113	78	117	102	109	105	79	104.7	6
R10	*	97	112	95	124	110	117	112	88	108.7	6
R11	*	*	*	122	121	128	105	102	85	117.7	7
R12	*	*	*	*	110	130	129	106	97	114.6	7
R13	*	*	*	*	*	132	133	130	112	131.2	7
R15	*	*	*	*	*	121	155	157	106	139.0	7
Candidate variety											
C1	*	*	*	*	*	*	55	32	27	43.3	3
C2	*	*	*	*	*	*	55	58	25	51.2	3
C3	*	*	*	*	*	*	*	46	44	55.7	4

Equal spaced states #2 <Germany>

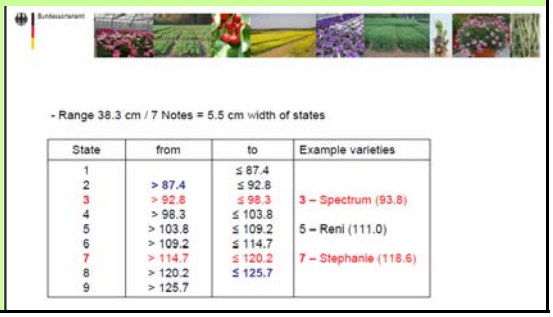


Division of the range of expression of the over-year means for the reference collection varieties into equal spaced states

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 – Reni (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 Assesement 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 ornemental & veg. crops)
- Same method for self and cross,
- The adjustable range changes according to dispersion of Historical data of the Example variety

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<Japan (cont.)>

What is the Fundamental Assessment Table (FAT) …

The Proposition by experts

The data accumulated in sufficient number of DUS growing test about several Example Varieties

Experimental data

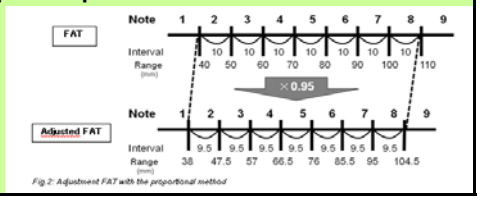
FAT

FAT is available only for species that had examined for sufficient experience of DUS growing test about several Example Varieties.

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

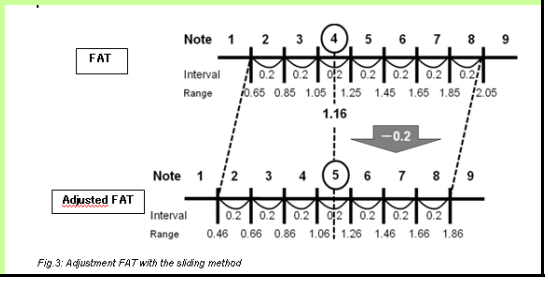
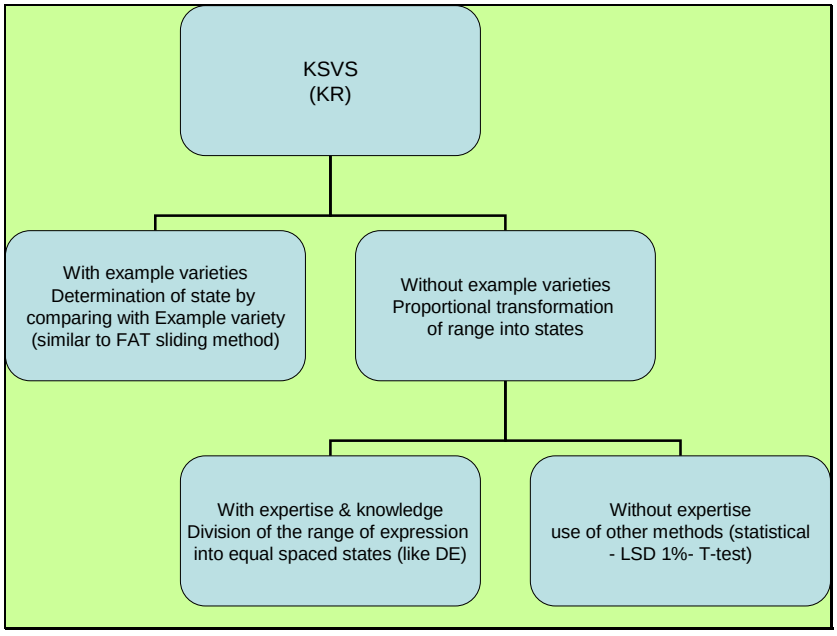


Fig.3: Adjustment FAT with the sliding method



NEXT STEPS

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

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[End of Annex and of document]