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SECOND ADDENDUM TO POSSIBLE EFFECT ON UNIFORMITY DECISIONS BETWEEN APPROACH 3 AND OTHER APPROACHES IN DOCUMENT TWP/1/17 "ASSESSING UNIFORMITY BY OFF-TYPES ON THE BASIS OF MORE THAN ONE GROWING CYCLE OR ON THE BASIS OF SUB-SAMPLES"

Document prepared by the Office of the Union

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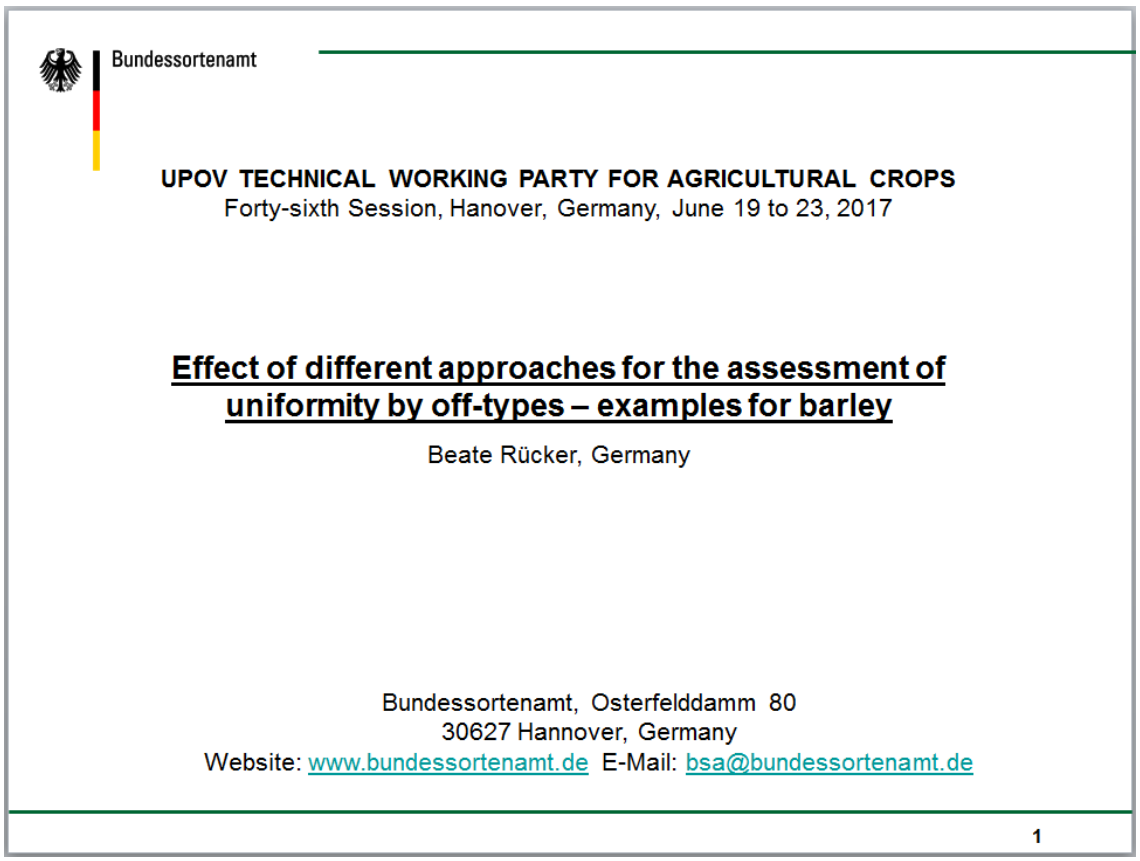
The Annex to this document contains a copy of a presentation on "Effect of different approaches for the assessment of Uniformity by off-types – examples for Barley", prepared by an expert from Germany that was made at the forty-sixth session of the Technical Working Party for Agricultural Crops (TWA).

[Annex follows]

ANNEX

EFFECT OF DIFFERENT APPROACHES FOR THE ASSESSMENT OF UNIFORMITY BY OFF-TYPES – EXAMPLES FOR BARLEY

Presentation prepared by an expert from Germany



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UPOV TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS
Forty-sixth Session, Hanover, Germany, June 19 to 23, 2017

Effect of different approaches for the assessment of uniformity by off-types – examples for barley

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Example: DUS trial for Winter barley in 2014 – 2015

Trial design:

- sample size of 1000 plants in the first cycle
- sample size of 2000 plants in the second (and third) cycle

Population standard: 0.1 %
Acceptance probability: ≥ 95%
Maximum number of allowed off-types:
3 in 1000 in the first cycle
5 in 2000 in the second cycle
6 in 3000 in the combined sample

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Example: DUS trial for Winter barley in 2014 – 2015

- Approach 1 is applied in DE for all crops
- DE system allows a re-submission of seed if first sample fulfills population standard of 0.5% (9 in 1000)
- In general breeders use this option if the first sample is > 0.1% (according to agreement in Europe, see CPVO-Test protocol)
- Approach 2 and 3 should only be applied if the same sample was tested in both cycles.

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After the second cycle, 11 varieties were observed with different decisions based on the different approaches.

Only variety 1, 4 and 7 were tested on the same sample in the two cycles.

Sample size Max. off-types	Cycle 1 1000 3		Cycle 2 2000 5		Approach 1 (DE approach)	Approach 2	Approach 3
Variety 1	3	+	7	-	third cycle	non-uniform	non-uniform
Variety 2	5	-	3	+	third cycle	non-uniform	non-uniform
Variety 3	8	-	5	+	third cycle	non-uniform	non-uniform
Variety 4	3	+	8	-	third cycle	non-uniform	non-uniform
Variety 5	5	-	2	+	third cycle	non-uniform	non-uniform
Variety 6	5	-	0	+	third cycle	uniform	uniform
Variety 7	6	-	5	+	third cycle	non-uniform	non-uniform
Variety 8	8	-	2	+	third cycle	non-uniform	non-uniform
Variety 9	4	-	1	+	third cycle	uniform	uniform
Variety 10	5	-	1	+	third cycle	uniform	uniform
Variety 11	3	+	5	+	uniform	uniform	non-uniform

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Different results in cycle 1 and 2 may be attributed to following reasons:

- The new sample for the second cycle was improved.
- The expression of anthocyanin coloration and glaucosity was stronger in one cycle due to environmental effects. Stronger expression can be linked to higher discrimination between varieties and higher sensitivity to detect off-types within varieties.
- Sampling effects.

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Variety 1

Cycle 1, 3 off types in 1000: 1 x stronger anthocyanin coloration of auricles,
1 x earlier heading,
1 x full sterile spikelet

Cycle 2, 7 off types in 2000: 2 x stronger anthocyanin coloration of auricles,
5 x stronger ear glaucosity

Cycle 3, 2 off types in 2000: 2 x stronger anthocyanin coloration of auricles

Variety 4

Cycle 1, 3 off types in 1000: 1 x stronger anthocyanin coloration of auricles,
1 x earlier heading,
1 x attitude sterile spikelet

Cycle 2, 8 off types in 2000: 4 x stronger anthocyanin coloration of auricles,
1 x earlier heading,
2 x weaker ear glaucosity
1 x without sterile spikelet

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Variety 1

Cycle 1, 3 off types in 1000: 1 x stronger anthocyanin coloration of auricles,
1 x earlier heading,
1 x full sterile spikelet

Cycle 2, 7 off types in 2000: 2 x stronger anthocyanin coloration of auricles,
5 x stronger ear glaucosity

Cycle 3, 2 off types in 2000: 2 x stronger anthocyanin coloration of auricles

➔ ***Accepted after third cycle***

Variety 4

Cycle 1, 3 off types in 1000: 1 x stronger anthocyanin coloration of auricles,
1 x earlier heading,
1 x attitude sterile spikelet

Cycle 2, 8 off types in 2000: 4 x stronger anthocyanin coloration of auricles,
1 x earlier heading,
2 x weaker ear glaucosity
1 x without sterile spikelet

➔ ***Withdrawn after second cycle***

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Conclusions:

- Due to the possibility of re-submission only Approach 1 is appropriate.
- Approach 1 allows a better consideration of environmental effects and sampling effects.
- More stringent decisions are taken with Approach 2 and 3.

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[End of Annex and of document]