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| International Union for the Protection of New Varieties of Plants |  |

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| Technical CommitteeFifty-Fourth SessionGeneva, October 29 and 30, 2018 | TC/54/27Original: EnglishDate: October 3, 2018 |

Number of growing cycles

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# EXECUTIVE SUMMARY

 The purpose of this document is to report on the consideration of the number of growing cycles in DUS examination.

 The TC is invited to note the discussions by the TWPs, at their sessions in 2017 and 2018, on the impact of using different numbers of growing cycles on DUS decisions using actual data.

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 The following abbreviations are used in this document:

 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

 TWPs: Technical Working Parties

 TWV: Technical Working Party for Vegetables

# Background

 The TC, at its fifty-second session, held in Geneva from March 14 to 16, 2016, received the following presentations on variety descriptions and the role of plant material, including minimum number of growing cycles for DUS examination (in order of presentation) (see document TC/52/29 Rev. “Revised Report”, paragraph 204):

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| Variety descriptions and the role of plant material, including minimum number of growing cycles for DUS examination | France (Mr. Richard Brand) |
| Development and use of variety descriptions | Germany (Ms. Beate Rücker) |
| Minimum number of growing cycles | Netherlands (Mr. Kees van Ettekoven) |
| Using variety descriptions and length of testing – A New Zealand perspective | New Zealand (Mr. Chris Barnaby) |

 The TC considered the discussion on the number of growing cycles in DUS examination and agreed to invite members of the Union to simulate the impact of using different numbers of growing cycles on DUS decisions using actual data and to report on their results at the TWP sessions in 2016 and at the fifty‑third session of the TC.

 The TC, at its fifty-third session, held in Geneva from April 3 to 7, 2017, considered document TC/53/21 “Number of growing cycles” (see document TC/53/31 “Report”, paragraphs 183 to 187).

 The TC considered the presentations made by experts at the TWP sessions in 2016, simulating the impact of using different numbers of growing cycles on DUS decisions using actual data, as set out in the Annexes to document TC/53/21.

 The TC noted the offers by members of the Union to make presentations to the TWPs, at their sessions in 2017, on the impact of using different numbers of growing cycles on DUS decisions using actual data and agreed to invite the TWPs to report to the TC, at its session in 2018.

 The TC noted the expression of interest by Authorities to reduce the costs associated with DUS examination and agreed that the number of growing cycles for DUS examination should be the minimum necessary for a robust DUS decision and the establishment of a reliable variety description.

 The TC agreed that it was not appropriate to generalize that ornamental varieties should be examined in a single growing trial while other types of crops should be examined in two growing cycles and agreed that the typical number of growing cycles should be established on a crop-by-crop basis.

# PRESENTATIONS TO THE TWPS AT THEIR SESSIONS IN 2017

## Technical Working Party for Agricultural Crops

 The TWA, at its forty-sixth session, held in Hannover, Germany, June 19 to 23, 2017, considered documents [TWP/1/21](http://www.upov.int/edocs/mdocs/upov/en/twa_46/twp_1_21.pdf) “Number of growing cycles”, [TWA/46/8](http://www.upov.int/edocs/mdocs/upov/en/twa_46/twa_46_8.pdf) and [TWA/46/8 Add](http://www.upov.int/edocs/mdocs/upov/en/twa_46/twa_46_8_add.pdf) “Impact of using different numbers of growing cycles on DUS decisions using actual data” (see document TWA/46/10 “Report”, paragraphs 36 to 41).

 The TWA received the following presentations, as reproduced in documents TWA/46/8 and TWA/46/8 Add. :

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| (a) “Impact of number of growing cycles on variety descriptions and discrimination power in wheat and barley”, prepared by an expert from Germany |
| (b) “Number of Growing Cycles in Potato”, prepared by an expert from the Netherlands |
| (c) “Number of growing cycles in potato varieties - DUS examination of lightsprouts”, prepared by an expert from Poland |
| (d) “Number of growing cycles: the impact on cereal variety descriptions”, prepared by an expert from the United Kingdom |

 The TWA agreed that discussions on the number of growing cycles in DUS examination for agricultural crops should continue and welcomed the offers by Australia, Denmark, France, Germany, the United Kingdom and ISF to make presentations at its forty-seventh session.

## Technical Working Party on Fruit Crops

 The TWF considered documents [TWP/1/21](http://www.upov.int/edocs/mdocs/upov/en/twa_46/twp_1_21.pdf) “Number of growing cycles” (see document TWF/48/13 “Report”, paragraphs 81 to 84)

 The TWF noted that the TC had agreed that it was not appropriate to generalize that ornamental varieties should be examined in a single growing trial while other types of crops should be examined in two growing cycles. It noted further that the TC had agreed that the typical number of growing cycles should be established on a crop-by-crop basis. However the TWF agreed to clarify to the TC that, in some cases in the fruit sector, the normal number of growing cycles needed to be established on variety-type by variety-type basis (for example rootstock varieties, male-female varieties).

## Technical Working Party on Automation and Computer Programs

 The TWC considered document TWP/1/21 “Number of growing cycles” (see document TWC/35/21 “Report”, paragraphs 45 to 51).

 The TWC considered document TWC/35/7 “Number of Growing Cycles in Potato” and received a presentation by an expert from the Netherlands containing the results of the simulation on the impact of using different numbers of growing cycles on DUS decisions using actual data for potato. A copy of the presentation is reproduced in the Annex to document TWC/35/7.

 The TWC noted that the results demonstrated that from the 37 characteristics observed, 73% would have had the same score and 24% would have had differences of only one note between the first growing cycle and the note from the first and second growing cycles combined.

 The TWC noted that the Netherlands was exploring the possibility of using molecular marker information to reduce the number of growing cycles for DUS examination of potato varieties.

# PRESENTATIONS TO THE TWPS AT THEIR SESSIONS IN 2018

## Technical Working Party for Agricultural Crops

 The TWA, at its forty-seventh session, held in Naivasha Kenya from May 21 to 25, 2018, considered document [TWA/47/5](http://www.upov.int/meetings/en/doc_details.jsp?meeting_id=47206&doc_id=405872) “Impact of the number of growing cycles on variety descriptions and discrimination power in potato” and received a presentation by an expert from Germany, a copy of which would be provided as document TWA/47/5 Add. (see document TWA/47/7 “Report”, paragraphs 35 to 38).

 The TWA agreed that variety descriptions generated over two growing cycles were more robust than those generated over a single growing cycle. The TWA also agreed that two growing cycles allowed a more robust assessment of individual characteristics.

 The TWA agreed that a robust decision on distinctness could be reached after a single growing cycle on the basis of a sufficiently large difference in characteristics.

 The TWA noted that DNA-marker information could provide supporting information in the DUS examination, as set out in document TGP/15 “Guidance on the Use of Biochemical and Molecular Markers in the Examination of Distinctness, Uniformity and Stability (DUS)”. The TWA noted the experience reported by the Netherlands that DNA-marker information was also used for enforcing plant breeders’ rights in combination with side-by-side verification of conformity of plant material to a protected variety.

## Technical Working Party on Automation and Computer Programs

 The TWC considered documents [TWC/36/6](http://www.upov.int/meetings/en/doc_details.jsp?meeting_id=47210&doc_id=408937) and [TWC/36/6 Add.](http://www.upov.int/meetings/en/doc_details.jsp?meeting_id=47210&doc_id=409518) “Impact of the number of growing cycles on variety descriptions and discrimination power” and received a presentation by an expert from Germany (see document TWC/36/15 “Report”, paragraphs 24 to 28).

 The TWC welcomed the statistical analysis quantifying the genotype-by-environment interaction for descriptions generated over years.

 The TWC agreed that variety descriptions generated over two growing cycles were more robust than those generated in one growing cycle only.

 The TWC agreed that it should be clarified that documents TWC/36/6 and TWC/36/6 Add. analyzed differences in individual characteristics over cycles and did not assess differences of varieties over all characteristics.

 The TWC noted the oral report by the Netherlands that a study was being conducted on the use of DNA‑markers as supporting information for decisions on distinctness and the TWC agreed to invite the Netherlands to report their work in a future meeting.

 *The TC is invited to note the discussions by the TWPs, at their sessions in 2017 and 2018, on the impact of using different numbers of growing cycles on DUS decisions using actual data.*

 [Annexes follow]

*Please see the pdf version*

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