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

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| Technical Working Party for VegetablesFifty-Ninth SessionVirtual meeting, May 5 to 8, 2025 | TWV/59/15Original: EnglishDate: April 11, 2025 |

Partial revision of the Test Guidelines for Cabbage

Document prepared by an expert from the Netherlands (Kingdom of)

Disclaimer: this document does not represent UPOV policies or guidance

 The purpose of this document is to present a proposal for a partial revision of the Test Guidelines for Cabbage (document TG/48/7 Rev. 2).

 The Technical Working Party for Vegetables (TWV), at its fifty-eighth session[[1]](#footnote-2), agreed that the Test Guidelines for Cabbage (*Brassica oleracea* L.: Brassica (White Cabbage Group); Brassica (Savoy Cabbage Group); Brassica (Red Cabbage Group) be partially revised (see document TWV/58/11 “Report”, Annex II).

 The following changes are proposed:

1. Addition of Characteristic 37 “Resistance to *Plasmodiophora brassicae* (Pb)”, including example varieties.
2. Addition of explanation Ad.37 “Resistance to *Plasmodiophora brassicae* (Pb)”

 The proposed changes are presented below in highlight and underline (insertion) and ~~strikethrough~~ (deletion).

## Proposed addition of new Characteristic 37 “Resistance to *Plasmodiophora brassicae* (Pb)”, including example varieties at the end of Table of Characteristics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 37 (+) | VS | Resistance to *Plasmodiophora brassicae* (Pb) | Résistance à *Plasmodiophora brassicae* (Pb*)* | Resistenz gegen *Plasmodiophora brassicae* (Pb) | Resistencia a *Plasmodiophora brassicae* (Pb) |  |  |
| **37.1** | **VS** | **– Race Pb: 0** | **– Pathotype Pb: 0** | **– Pathotyp Pb: 0** | **– Raza Pb: 0** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Passat | 1 |
|  |  | present | présente | vorhanden | presente | Kilaton | 9 |
| **37.2** | **VS** | **– Race Pb: 1** | **– Pathotype Pb: 1** | **– Pathotyp Pb: 1** | **– Raza Pb: 1** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Passat | 1 |
|  |  | present | présente | vorhanden | presente | Kilaton | 9 |
| **37.3** | **VS** | **– Race Pb: 2** | **– Pathotype Pb: 2** | **– Pathotyp Pb: 2** | **– Raza Pb: 2** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Passat, Kilaton | 1 |
|  |  | present | présente | vorhanden | presente |  | 9 |
| **37.4** | **VS** | **– Race Pb: 3** | **– Pathotype Pb: 3** | **– Pathotyp Pb: 3** | **– Raza Pb: 3** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Passat | 1 |
|  |  | present | présente | vorhanden | presente | Kilaton | 9 |

## Proposed addition of an explanation Ad. 37 “Resistance to *Plasmodiophora brassicae* (Pb) in Chapter 8.2 “Explanations for individual characteristics”

Ad. 37: Resistance to *Plasmodiophora brassicae* (Pb)

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | *Plasmodiophora brassicae*  |
| 2. | Quarantine status | no |
| 3. | Host species | *Brassica oleracea* |
| 4. | Source of inoculum | Naktuinbouw[[2]](#footnote-3) (NL)  |
| 5. | Isolate | Race Pb: 0, Pb: 1, Pb: 2 and Pb: 3 |
| 6. | Establishment isolate identity | with genetically defined differentials from Naktuinbouw (NL)The most recent table is available through ISF at <https://www.worldseed.org/our-work/plant-health/differential-hosts/> |
| 7. | Establishment pathogenicity | symptoms on susceptible *Brassica oleracea spp.* |
| 8. | Multiplication inoculum |  |
| 8.1 | Multiplication medium | Plant roots |
| 8.2 | Multiplication variety | Susceptible variety Bartolo (WC), Granaat (CC) 3 |
| 8.3 | Plant stage at inoculation | Seedling, 1 week after sowing  |
| 8.4 | Inoculation medium | Water |
| 8.5 | Inoculation method | 2 ml spore suspension (107 sp/ml)Pipette to the base of each seedling. |
| 8.6 | Harvest of inoculum | Harvest roots 6-8 weeks after inoculation |
| 8.7 | Check of harvested inoculum | Microscopic count |
| 8.8 | Shelf life/viability inoculum | Frozen 3 years, room temperature 1-2 days |
| 9. | Format of the test |  |
| 9.1 | Number of plants per genotype | 20 plants  |
| 9.2 | Number of replicates | 2 replicates (2 x 10) |
| 9.3 | Control varieties | Susceptible: Bartolo (WC) 2Resistant to race Pb: 0 051632 Bejo (WC), Clapton (CF),Lodero (RC)Resistant to race Pb: 1 Clapton (CF), Lodero (RC)Resistant to race Pb: 2 Lodero (RC)Resistant to race Pb: 3 051632 Bejo (WC)  |
| 9.5 | Test facility | Glasshouse or climatic room |
| 9.6 | Temperature | 20-22°C |
| 9.7 | Light | Natural, extended to 16 h if needed |
| 9.9 | Special measures | A moderate amount of water is required to prevent rotting.Keep the soil saturated in the first week. During plant growth the soil should notbe too dry to lower the soil temperature.  |
| 9.8 | Season | Not in winter, not in too warm conditions if test performed in greenhouse |
| 10. | Inoculation |  |
| 10.1 | Preparation inoculum | Symptomatic roots are homogenized ca. 1 min in a blender. Dilute clubs 1:4 with demineralized water. Blender the mix for lessthan 1 minute. (Beware: longer blendering may cause overheating of the suspension) |
| 10.2 | Quantification inoculum | count spores; adjust to 107 spores per ml |
| 10.3 | Plant stage at inoculation | 1 week old seedlings |
| 10.4 | Inoculation method | Pipette 1 ml on both sides at the base of each seedling, totalling 2 ml per plant.  |
| 10.7 | Observation, evaluation and end of test | 6 weeks after inoculation (destructive) |
| 11. | Observations |  |
| 11.1 | Method | Visual: observation of severe galling and growth retardationDestructive: observation on a 0-3 scale for galling |
| 11.2 | Observation scale | class 0 = no swellings or a few small spheroid galls class 1 = very slight swelling, usually confined to the lateral rootsclass 2 = moderate swelling on lateral and/or tap roots orslight swelling of the main root and browning and ultimately death of all the lateral roots class 3 = severe swelling on lateral and/or tap roots |
| 11.3 | Validation of test | Validation on controls. Expected response of controls: Susceptible control: -most plants in classes 2 and 3Resistant control:-most plants in classes 0 and 1 |
| 12. | Interpretation of data in terms of UPOV characteristic states | [1] absent: distribution of plants in the classes comparable with susceptible control[9] present: distribution of plants in the classes comparable with resistant control |
| 13. | Critical control points | Clubroot is a zoosporic pathogen. Keep isolates spatially well-separated. |



[End of document]

1. held via electronic means, from April 22 to 25, 2024. [↑](#footnote-ref-2)
2. Naktuinbouw: resistentie@naktuinbouw.nl

3 WC=White cabbage, CC=Chinese cabbage, RC=Red cabbage, CF=Cauliflower [↑](#footnote-ref-3)