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

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| Technical Working Party for Vegetables  Fifty-Ninth Session Virtual meeting, May 5 to 8, 2025 | TWV/59/15  Original: English  Date: 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) 2  Resistant 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 not  be 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 less  than 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 retardation  Destructive: 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 roots  class 2 = moderate swelling on lateral and/or tap roots or  slight 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 3  Resistant 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. |

Afbeelding met ginseng, pythium

Automatisch gegenereerde beschrijving

[End of document]

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

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