

# Validation report

## DAS-ELISA TMV

Article No.: 190477 (TMV Complete kit 96) / 190475 (TMV Complete kit 480) / 190472 (TMV Complete kit 960)

### General information:

|                 |                                                 |
|-----------------|-------------------------------------------------|
| Target Pathogen | TMV (Tobacco mosaic virus / Tobamovirus tabaci) |
| Genus           | <i>Tobamovirus</i>                              |
| Method          | DAS-ELISA                                       |

### Technical information:

|                |                                                                                                                                                                                       |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Antibodies     | Polyclonal antibodies developed against a TMV isolate (FAL-76) from Switzerland.                                                                                                      |
| Sampling       | Leaf samples: 1:20 (w/v) in extraction buffer "General"<br>Seed samples: 1:25 (w/v) in extraction buffer "General" with soaking the samples at 4°C for 4 hours before homogenization. |
| Controls       | Negative control (NC): lyophilized extracts from healthy plants<br>Positive control (PC): lyophilized TMV infected plant extracts                                                     |
| Working volume | 200 µl / well                                                                                                                                                                         |

### Host matrix:

|                         |                                                                                                                                                                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tested plant material   | Leaf, seed<br>Mechanical transmission, no true vectors, incidental transmission by chewing insects reported                                                                                                                                                                                   |
| Tested species infected | <i>Chenopodium amaranticolor</i><br><i>Cucumis sativa</i> (Cucumber)<br><i>Lactuca sativa</i> (Lettuce)<br><i>Nicotiana clevelandii</i> (Tobacco)<br><i>Nicotiana tabacum</i> "White Burley" (Tobacco)<br><i>Nicotiana tabacum</i> "Xanthi" (Tobacco)<br><i>Solanum lycopersicum</i> (Tomato) |

### Specificity:

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Analytical Specificity                                         | 100%                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Number of tested samples from target organism (True Positives) | 81 (PT: 100%)                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Diagnostic Specificity                                         | 100%                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Number of tested samples non-target organism (True Negatives)  | >100 (PT: 100%)                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Detected isolates / geographic regions (Inclusivity)           | TMV (Tobacco, Switzerland)<br>TMV 082001 ( <i>C. Amaranticolor</i> , Switzerland)<br>TMV Mt-Favet (Tomato, Switzerland)<br>TMV Mt-Favet+Mirza (Tomato, Switzerland)<br>TMV 521 (Cucumber, Switzerland)<br>TMV TH1-3 (Cucumber, Switzerland)<br>TMV TH1-2 (Cucumber, Switzerland)<br>TMV Rougette du Midi (Lettuce, Switzerland)<br>TMV 27052021 (Cucumber, Switzerland)<br>TMV 24082021 (Cucumber, Switzerland)<br>TMV 4153 (Bean, Switzerland) |

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|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              | TMV PMI-1 (Tobacco, Switzerland)<br>TMV PMI-2 (Tobacco, Switzerland)<br>TMV PMI-3 (Tobacco, Switzerland)<br>TMV PMI-4 (Tobacco, Switzerland)<br>TMV ZZB-312 (Tomato, Netherlands)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Cross reaction with (Exclusivity)            | CGMMV (Cucumber green mottle mosaic virus)<br>ToMV (Tomato mosaic virus)<br>ToBRFV (Tomato brown rugose fruit virus)<br><br><b>Cross-reaction with other tobamoviruses cannot be excluded.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| No cross reaction tested with (Exclusivity)  | AMV (Alfalfa mosaic virus)<br>BCMNV (Bean common mosaic necrosis virus)<br>BCMV (Bean common mosaic virus)<br>BYDV (Barley yellow dwarf virus)<br>CMV (Cucumber mosaic virus)<br>PFBV (Pelargonium flower break virus)<br>PLRV (Potato leafroll virus)<br>PNRSV (Prunus necrotic ringspot virus)<br>PVS (Potato virus S)<br>PVY (Potato virus Y)<br>Rs ( <i>Ralstonia solanacearum</i> )<br>SMV (Soybean mosaic virus)<br>TSWV (Tomato spotted wilt virus)<br>ZYMV (Zucchini yellow mosaic virus)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| No matrix effect observed with (Selectivity) | <i>Allium cepa</i> (Onion)<br><i>Allium sativum</i> (Garlic)<br><i>Beta vulgaris</i> (Sugar beet)<br><i>Brassica rapa</i> (Chinese cabbage)<br><i>Cannabis sativa</i> (Hemp)<br><i>Capsicum</i> (Pepper)<br><i>Chenopodium amaranticolor</i><br><i>Chenopodium quinoa</i> (Quinoa)<br><i>Cucumis melo</i> (Melon)<br><i>Cucumis metuliferus</i> (Kiwano)<br><i>Cucumis sativa</i> (Cucumber)<br><i>Cucurbita pepo</i> (Zucchini)<br><i>Fragaria ananassa</i> (Strawberry)<br><i>Hordeum vulgare</i> (Barley)<br><i>Lactuca sativa</i> (Lettuce)<br><i>Malus domestica</i> (Apple)<br><i>Nicotiana benthamiana</i> (Tobacco)<br><i>Nicotiana clevelandii</i> (Tobacco)<br><i>Nicotiana glutinosa</i> (Tobacco)<br><i>Nicotiana occidentalis</i> (Tobacco)<br><i>Nicotiana tabacum</i> "Xanthi" (Tobacco)<br><i>Pelargonium</i> (Geranium)<br><i>Petunia hybrida</i> (Petunia)<br><i>Phaseolus vulgaris</i> (Bean)<br><i>Physalis peruviana</i> (Bladder cherries)<br><i>Prunus domestica</i> (Plum)<br><i>Prunus persica</i> (Peach)<br><i>Pyrus communis</i> (Pear)<br><i>Raphanus sativus</i> (Radish)<br><i>Rubus idaeus</i> (Raspberry) |

|  |                                                                                                                                                                                                               |
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|  | <i>Sinapis alba</i> (White mustard)<br><i>Solanum lycopersicum</i> (Tomato)<br><i>Solanum tuberosum</i> (Potato)<br><i>Vinca minor</i> (Vinca)<br><i>Vitis vinifera</i> (Grapevine)<br><i>Zea mays</i> (Corn) |
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**Sensitivity:**

|                                          |                                                                                                                              |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Diagnostic Sensitivity</b>            | 100%   PT: 100%                                                                                                              |
| <b>Analytical Sensitivity / LoD</b>      | 10 <sup>-7</sup> dilution of infected tissue (pathogen titer unknown)                                                        |
| <b>Sensitivity on host matrix</b>        | TMV on leaves of tobacco: 1: 19'531'250 dilution<br>TMV on leaves of tomato: 1:19'531'250 dilution<br>Pathogen titer unknown |
| <b>Other sensitivity characteristics</b> | PT: 100% of medium and heavily contaminated seed lots detected (70 samples with each 250 seeds).                             |

**Validation:**

|                               |                                                                                                                                                  |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Internal validation</b>    | 1998, 2001, 2007 (last internal validation)                                                                                                      |
| <b>External validation</b>    | 1 PT in 2023 with 15 laboratories (Netherlands)                                                                                                  |
| <b>Reproducibility</b>        | 100%                                                                                                                                             |
| <b>Repeatability</b>          | 100%                                                                                                                                             |
| <b>Validation information</b> | Internally, the reagents have been validated with the BIOREBA isolate collection composed of various samples collected within the last 40 years. |

Validation release Date:  
June, 28<sup>th</sup>, 2023

QC manager:



Version: 3 – 28.04.2025 – Additional validation information on analytical sensitivity and sensitivity on host matrix.