

Validation report

DAS-ELISA ToBRFV

Article No.: 152877 (ToBRFV Complete kit 96) / 152875 (ToBRFV Complete kit 480) / 152872 (ToBRFV Complete kit 960)

General information:

Target Pathogen	ToBRFV (Tomato brown rugose fruit virus)
Genus	<i>Tobamovirus</i>
Method	DAS-ELISA

Technical information:

Antibodies	Polyclonal antibodies developed against a ToBRFV isolate from tomato (origin: Germany) and monoclonal antibodies developed against an epitope of the ToBRFV coat protein
Sampling	Leaf samples: 1:20 (w/v) in extraction buffer "General" Fruit samples: 1:20 (w/v) in extraction buffer "General" Seed samples: 1:20 (w/v) in extraction buffer "General"
Controls	Negative control (NC): lyophilized extracts from healthy plants Positive control (PC): lyophilized extracts from ToBRFV-infected plants
Working volume	200 µl / well

Host matrix:

Tested plant material	Leaf, fruit, seed Seed transmittable / mechanical transmittable
Tested species infected	<i>Solanum lycopersicum</i> (Tomato) <i>Capsicum</i> spp. (Peppers) <i>Nicotiana</i> spp. (Tobacco)

Specificity:

Analytical Specificity	100%
Number of tested samples from target organism (True Positives)	17
Diagnostic Specificity	96.6%
Number of tested samples non-target organism (True Negatives)	56
Detected isolates / geographic regions (Inclusivity)	ToBRFV PV-1236 (Germany, Tomato) ToBRFV PV-1244 (Germany, Tomato) ToBRFV PV-1241 (Israel, Tomato) ToBRFV PV-1278 (Netherlands, Tomato) ToBRFV PV-1300 (Cyprus, Tomato) ToBRFV INF.110721-A (Israel, Tomato) ToBRFV INF.110721-B (Israel, Tomato) ToBRFV INF.110721-C (Israel, Tomato) ToBRFV INF.110721-D (Israel, Tomato) ToBRFV INF.110721-E (Israel, Tomato) ToBRFV INF.110721-F (Israel, Tomato) ToBRFV INF.130721-A (Israel, Pepper) ToBRFV INF.130721-B (Israel, Pepper) ToBRFV INF.130721-C (Israel, Pepper) ToBRFV BI-023 (Switzerland, Tomato)

	ToBRFV BI-023 (Switzerland, Tobacco) ToBRFV 250626 (Switzerland, Tomato)
Cross reaction with (Exclusivity)	Weak cross-reactivity was observed with certain PMMoV isolates in combination with <i>Nicotiana</i> spp. sample matrix
No cross reaction tested with (Exclusivity)	CGMMV (Cucumber green mottle mosaic virus) CMV (Cucumber mosaic virus) INSV (Impatiens necrotic spot virus) PaMMV (Paprika mild mottle virus) PMMoV (Pepper mild mottle virus) PepMV (Pepino mosaic virus) SHMV (Sunn-hemp mosaic virus) TBRV (Tomato black ring virus) TBSV (Tomato bushy stunt virus) TMGMV (Tobacco mild green mosaic virus) TMV (Tobacco mosaic virus) TNV (Tobacco necrosis virus) ToANV (Tomato apex necrosis virus) ToMV (Tomato mosaic virus) ToMMV (Tomato mottle mosaic virus) ToRSV (Tomato ringspot virus) TSV (Tobacco streak virus) TSWV (Tomato spotted wilt virus) TVCV (Turnip vein clearing virus) TYLCV (Tomato yellow leaf curl virus)
No matrix effect observed with (Selectivity)	<i>Solanum lycopersicum</i> (Tomato) – leaf, seed and fruit <i>Capsicum annum</i> (Chili/Pepper) – leaf and seed <i>Nicotiana</i> spp. (Tobacco) - leaf <i>Cucumis metuliferus</i> (horned melon) - leaf <i>Chenopodium Quinoa</i> (Quinoa) - leaf

Sensitivity:

Diagnostic Sensitivity	100%
Analytical Sensitivity /LoD	10 ⁻⁴ to 10 ⁻⁷ dilution of infected tissue (pathogen titer unknown)
Sensitivity on host matrix	Tomato leaves: 3.9x10 ⁻⁶ dilution of infected tissue (pathogen titer unknown) Tomato fruit: 3.1x10 ⁻⁴ dilution of infected tissue (pathogen titer unknown) Tomato seeds: 1.9x10 ⁻⁷ dilution of infected tissue (pathogen titer unknown)
Other sensitivity characteristics	Testing of 1'000 tomato seed: ToBRFV-infected tomato seed were mixed with healthy tomato seed: - 100% infection: up to 1.9x10⁻⁷ dilution - 40% infection: up to 3.9x10⁻⁶ dilution - 10% infection: up to 1.5x10⁻⁵ dilution - 1% infection: up to 1.2x10⁻³ dilution - 0.1% infection: up to 2.5x10⁻² dilution (spiked extract)

Validation:

Internal validation	2026
External validation	-

Reproducibility	100%
Repeatability	100%
Validation information	Internally, the reagents have been validated with the BIOREBA isolate collection, composed of various samples with diverse host plant range, collected within the last 40 years.

Validation release Date:
July, 6th, 2026

QC manager:



Version: 3 – 06.07.2026 – Adaptations from last version: change of Antibody composition for a specific ToBRFV DAS-ELISA.