

**EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION**  
**ORGANISATION EUROPEENNE ET MEDITERRANEENNE POUR LA PROTECTION DES PLANTES**  
**Summary sheet of validation data for a diagnostic test**

The EPPO Standard PM 7/98 *Specific requirements for laboratories preparing accreditation for a plant pest diagnostic activity* describes how validation should be conducted. It also includes definitions of performance criteria.

<b>Laboratory contact details</b>	Council for Agricultural Research and Economics– Research Centre for Plant Protection and Certification Via Carlo Giuseppe Bertero, 22, 00156 Rome, Italy
<b>Short description of the test</b>	detection of <i>Pantoea stewartii</i> subsp. <i>stewartii</i> by Molecular real time PCR in maize seeds according to Scala et al., 2023
<b>Date, reference of the validation report</b>	2024-03-01 - CREA-DC_ctg3_real_time_PCR by Scala et al., 2023
<b>Validation process according to EPPO Standard PM7/98?</b>	yes
<b>Is the lab accredited for this test?</b>	no
<b>Was the validated data generated in the framework of a project?</b>	Other_project
<b>If yes, please specify</b>	Proteggo 1.4
<b>Description of the test</b>	
<b>Organism(s)</b>	<i>Pantoea stewartii</i> subsp. <i>stewartii</i> (ERWIST)
<b>Detection / identification</b>	detection
<b>Method(s)</b>	Molecular real time PCR
<b>Method: Molecular real time PCR</b>	
<b>Reference of the test description</b>	
<b>As or adapted from an EPPO diagnostic protocol</b>	no
<b>Kit</b>	
<b>Is a kit used</b>	no
<b>Other information</b>	
<b>Reaction type</b>	Simplex
<b>Other details on the test</b>	The validation data related to the analytical sensitivity, analytical specificity and repeatability are published in Scala et al 2023. The validation data related to diagnostic sensitivity, diagnostic specificity and reproducibility are the results of TPS organized by CREA-DC with the participation of 15 Italian OL. The samples were analysed with two different TAQ polymerase. Seven OL employed the

	2X Sybr master mix from Applied Biosystems (Thermo Fisher Scientific) and eight OL used the GoTaq qPCR Master Mix 2x Promega. The extraction of DNA was performed by the different participants according to their routine methods adopted to perform the official analysis of <i>Pantoea stewartii</i> subsp <i>stewartii</i> .
<b>Performance Criteria :</b>	
<b>Organism 1.:</b>	<b><i>Pantoea stewartii</i> subsp. <i>stewartii</i>(ERWIST)</b>
<b><u>Analytical sensitivity</u></b>	
<b>What is smallest amount of target that can be detected reliably?</b>	10 fg evaluated on bacterial DNA 10-fold dilution from 10 ng to 10 fg. $10^1$ cfu/ml evaluated on DNA extracted from bacterial cell suspension, from $10^8$ to $10^1$ CFU/ml. $10^3$ cfu/ml evaluated on DNA extracted from maize seeds extract spiked with bacterial cell suspension at known concentration. The spiked samples have been prepared by adding bacterial suspensions from $10^8$ to 10 CFU/ml to healthy seed extracts. Each sample was repeated in three biological replicates and each biological replcate was repeated in two technical replicates.
<b><u>Diagnostic sensitivity</u></b>	
<b>Proportion of infected/infested samples tested positive compared to results from the standard test, see appendix 2 of PM 7/98</b>	100% calculated with 12 samples consisted of 6 artificially infected positive samples, 6 negative samples, prepared as described below (details of TPS).
<b>Standard test(s)</b>	comparison of samples with known status
<b><u>Analytical specificity - inclusivity</u></b>	
<b>Number of strains/populations of target organisms tested</b>	5 strains: CREA-DC 1775; CREA-DC 1869; CREA-DC 1870; CREA-DC 1899; CREA-DC 1900
<b>Specificity value</b>	100%
<b><u>Analytical specificity - exclusivity</u></b>	
<b>Number of non-target organisms tested</b>	40 strains belonging to different genera or species of bacterial pathogens present in CREA-DC bacterial collection. The list of the 40 strains were reported in Scala et al. 2023
<b>Specificity value</b>	100%
<b><u>Diagnostic Specificity</u></b>	
<b>Proportion of uninfected/uninfested samples (true negatives) testing negative compared to results from a standard test</b>	100% calculated with 12 samples consisted of 6 artificially infected positive samples, 6 negative samples. In the samples panel were included two samples of bacterial suspension at $10^6$ cfu/ml of <i>Pantoea stewartii</i> subsp. <i>indologenes</i> and <i>P. ananatis</i> respectively.
<b>Specify the test(s)</b>	comparison of samples with known status
<b><u>Reproducibility</u></b>	
<b>Provide the calculated % of agreement for a given level of the pest (see PM 7/98)</b>	100%

<b>Repeatability</b>	
<b>Provide the calculated % of agreement for a given level of the pest (see PM 7/98)</b>	100%
<b>Test performance study</b>	
<b>Test performance study?</b>	yes
<b>Brief details of the test performance study and its output. It available, link to published article/report</b>	TPS was performed with 15 Italian OL. Each participant received a panel of 12 samples consist in: 4 samples of healthy maize seed extract, 2 samples of maize seed extract spiked with $10^4$ cfu/ml of bacterial cell suspension of <i>P. stewartii</i> subsp. <i>stewartii</i> , 3 samples of maize seed extract spiked with $10^5$ cfu/ml of bacterial cell suspension of <i>P. stewartii</i> subsp. <i>stewartii</i> , 1 sample of maize seed extract spiked with $10^6$ cfu/ml of bacterial cell suspension of <i>P. stewartii</i> subsp. <i>stewartii</i> , 1 sample of $10^6$ cfu/ml of bacterial cell suspension of <i>Pantoea stewartii</i> subsp. <i>indologenes</i> , 1 samples of $10^6$ cfu/ml of bacterial cell suspension of <i>P. ananatis</i> .
The following complementary files are available online:	<ul style="list-style-type: none"> <li>• <a href="#">Scala et al., 2023</a></li> <li>• <a href="#">CREA-DC_TPS</a></li> </ul>

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