update on activities of the Technical Panel on Diagnostic Protocols (TPDP) FROM MAY 2016 TO APRIL 2017

*(Prepared by the IPPC Secretariat)*

# 1. Background

The IPPC Secretariat support for the Technical Panel on Diagnostic Protocols (TPDP) are:

* Ms Adriana G. MOREIRA (lead)
* Mr Piotr WLODARCZYK (support)
1. The TPDP membership and contact information can be found on [IPP](https://www.ippc.int/publications/technical-panel-diagnostic-protocols-tpdp-membership-and-contact-information)[[1]](#footnote-1). In Table 1 there is a simplified version of the TPDP membership as of April 2017.

**Table 1.** TPDP membership (as of April 2017) and expertise of its members

| **Participant role** | **Name (country)** | **Expertise** | **Term expires** |
| --- | --- | --- | --- |
| Steward | Ms Jane CHARD (United Kingdom) |  |  |
| Assistant steward | Mr Guillermo S. CHINCHILLA (Costa Rica) |  |  |
| Member | Mr Robert TAYLOR (New Zealand) | Bacteriology | May 2021 (2nd term) |
| Member | Ms Liping YIN (China) | Botany | April 2018 (2nd term) |
| Member | Mr Norman B. BARR (United States) | Entomology | July 2022 (2nd term) |
| Member | Ms Juliet GOLDSMITH (Jamaica) | Entomology | November 2019 (1st term) |
| Member | Mr Johannes DE GRUYTER (The Netherlands) | Mycology | April 2018 (2nd term) |
| Member | Ms Géraldine ANTHOINE (France) | Nematology | April 2019 (2nd term) |
| Member | Mr Delano JAMES (Canada) | Virology | November 2020 (2nd term) |
| Member | Mr Brendan RODONI (Australia) | Virology (and back up for bacteriology) | July 2022 (2nd term) |

**2. TPDP volume of work**

The TPDP work programme currently comprises 13 diagnostic protocols (DPs) under six disciplines in various stages of development (Figure 1). Most of the DPs are drafted. However, one DP “Tephritidae: Identification of immature stages of fruit flies of economic importance by molecular techniques (2006-028)” has “pending status”[[2]](#footnote-2) due the lack of validated and verified data on molecular methods for identification of fruit fly larvae of all genera.



**Figure 1.** Number of diagnostic protocols per discipline under the TPDP work programme.

1. A total of 22 draft DPs progressed in the standard setting process in 2016. In 2017, all 13 draft DPs that are currently on the TPDP work programme are projected to flow through the standard setting process (Figure 2). The timeline of adopted DPs shows an unprecedented number of DPs adopted in the recent years, representing the management of over 100 DP authors (Figure 3).

Figure 2. Medium term plan forecast for draft diagnostic protocols (annexes to ISPM 27).

**Figure 3.** Number of adopted diagnostic protocols (annexes to ISPM 27) per year.

1. The TPDP work programme is delivered through several activities. Since May 2016, the activities were as follows:
* two consultations[[3]](#footnote-3) (30 January – 30 June 2015 and 01 July – 30 September 2016): five draft DPs
* two DP notification periods[[4]](#footnote-4) (01 July – 15 August 2016 and 15 December 2016 – 30 January 2017): 11 draft DPs. The draft DP for *Tomato spotted wilt virus*, *Impatiens necrotic spot virus* and *Watermelon silver mottle virus* (2004-019) received an objection during the July – August notification period and was submitted to the DP notification period again in December 2016, whereas a second objection was received.
* four Expert Consultations on draft diagnostic protocols (ECDP)[[5]](#footnote-5) (15 April – 15 May, 14 October – 1 December, 15 November – 15 December and 5 December 2016 – 10 January 2017)): six draft DPs.
* fourteen TPDP e-decisions: 14 draft DPs.

**Highlights of the work**

The TPDP continued to deliver its work programme during the May 2016 to April 2017 period, managing more than 100 DP authors from various countries[[6]](#footnote-6). In 2016 ten DPs were adopted as annexes to ISPM 27 (*Diagnostic protocols for regulated pests*). This meant an enormous workload for all involved. To date, there are 22 adopted DPs, annexes to ISPM 27.

The panel engaged in several discussions on horizontal issues that may affect diagnostics, such as quality assurance, best practices for DNA sequencing, controls for molecular methods, next generation sequencing (NGS) technologies and interpretation of the results of serological tests. The panel also engaged in discussions on the ongoing need to develop and update the DPs and on their usefulness, highlighting that the DPs are an essential part of surveillance programmes and the foundations for pest reporting. Diagnostic protocols also support pest eradication programmes, export certification, import inspections and the application of appropriate phytosanitary treatments.

The TPDP also reviewed its working procedures related to information to be provided to the DP drafting groups by revising the Instruction to Authors[[7]](#footnote-7) and a brochure targeted on communicating how to engage DP authors in a more meaningful way and to explain how the standard setting process works, in particular for the development of diagnostic protocols[[8]](#footnote-8).

The panel was informed and consulted on the drafting of ISO standard 13484 (*Horizontal methods for molecular biomarker analysis*), an ISO draft standard related to plant health diagnostics, and provided technical input to ensure this standard considered appropriate phytosanitary issues. The panel, through its members, also liaised with the Convention on Biological Diversity (CBD) Secretariat on diagnostic issues related to the Global Taxonomy Initiative (GTI) in an effort to try to obtain more information about the GTI work and how a synergistic relationship can be established between the TPDP and GTI, in particular for the development of better diagnostic protocols. The panel was also updated by an expert from the European and Mediterranean Plant Protection Organization (EPPO) on EPPO’s progress in developing regional diagnostic protocols.

**3. TPDP Meetings**

1. The TPDP has held the following meetings since May 2016 (reports are posted on the IPP[[9]](#footnote-9)):
* 2016 TPDP July (face-to-face) meeting: 11 – 15 July 2016, Montego Bay (Jamaica)
* 2016 TPDP September virtual meeting
* 2017 TPDP February 2017 (face-to-face) meeting: 13 – 17 February 2017, FAO, Rome (Italy) [[10]](#footnote-10)
1. Summaries of the discussions and outcomes of each meeting are detailed below, as well as the intersession activities.

Detailed information on the draft DPs submitted to the various steps of the standard setting process can be found in the Commission on Phytosanitary Measures (CPM-12) document CPM 2017/22 (*Report on the activities of the Standards Committee*)[[11]](#footnote-11).

**2016 July Meeting (Montego Bay, Jamaica)[[12]](#footnote-12)**

1. The Secretariat presented the status of the TPDP work programme, highlighting the dates when the draft DPs are expected to reach the various steps in the standard setting process noting that, in an optimistic scenario, all draft DPs that are currently on the TPDP work programme should be submitted for adoption by 2019.
2. The TPDP conducted detailed revisions of the following draft DPs:
* *Candidatus* Liberibacter spp. on Citrus (2004-010)
* *Puccinia psidii* (2006-018)
* *Begomoviruses* transmitted by *Bemisia tabaci* (2006-023)
* *Xylella fastidiosa* (2004-024)

It was noted that the draft DPs for *Candidatus* Liberibacter spp. on *Citrus* (2004-010) and for *Puccinia psidii* (2006-018) had been submitted to the Expert Consultation on draft DPs in 2016 prior to the meeting. The draft DP for *Xylella fastidiosa* (2004-024) was submitted in the fourth quarter of 2016.

Regarding the loop-mediated isothermal amplification (LAMP) method, it was noted that this method may require licenses in specific countries and regions. Additional guidance on the use of LAMP for diagnosis purposes was included in the Instructions to Authors.

The Secretariat presented a general overview of the TPDP work programme for the coming years. Plans for submitting the draft DPs for the Expert Consultations, consultations of draft ISPMs and the DP notification periods were reviewed.

The panel discussed a number of horizontal issues relating to the phytosanitary diagnostics such as best practices for sequencing, because molecular methods are included more frequently in draft DPs as part of the minimum requirements for testing, and negative extraction controls in the molecular tests. The panel discussed the level of the minimum requirements for controls for molecular tests for different groups of organisms and came to some general conclusions but agreed to discuss this further at the next meeting. The TPDP noted that controls should always be provided, and the minimum controls required should be clearly indicated. The TPDP also identified the need for guidance on controls for enzyme-linked immunosorbent assay (ELISA) tests as this is a horizontal issue relevant to all diagnostic protocols and agreed to develop a discussion paper.

1. In the discussion on the terminology used in the DPs, the panel considered the use of terms “methods”, “tests” and “assays”. Taking into account relevant provisions of ISPM 5 (*Glossary of the phytosanitary terms*) and ISPM 27, the panel agreed that in the newly developed DPs terms “tests” and “methods” could be used, while the use of the term “assays” should be avoided as it may be interpreted differently in various languages and may lead to confusion.
2. One member introduced a paper on the next generation sequencing (NGS) technologies, which are relatively new diagnostic methods that allow the sequencing of the whole genome of an organism. The use of these methods has resulted in the discovery of previously undetected microorganisms. The current researches also show that some viruses present in plants do not cause diseases, but may be commensal agents or even be beneficial for the plant. The panel stressed that the key issue for the NGS is the correct interpretation of the results and agreed that further discussions were needed on the potential implications of the use of NGS as a diagnostic tool.
3. In relation to the use of molecular techniques for phytosanitary diagnostics, the panel discussed whether these methods detected living organisms or only their DNA. The panel agreed that molecular tests were able to detect viable and non-viable organisms and requested the SC to consider the issue.
4. In the discussion on the challenges of the TPDP work, the panel stressed the need for the review and update of the adopted DPs, especially to take into account new science and new technologies, as outlined in task 5 in the TPDP Specification[[13]](#footnote-13). The TPDP noted that new strains of PPV have been detected which were not covered by the adopted DP 2: *Plum pox virus* and panel invited the SC to consider adding the revision of this DP to the TPDP work programme.
5. The TPDP recalled that the draft questionnaire on the value and use of DPs, proposed a few years ago, had been put “on hold” by the SC because, at the time, there were not many DPs adopted. The TPDP agreed that it is still too premature; most DPs were recently adopted and contracting parties may not have had the time to fully implement them.
6. The panel agreed that in the near future the development of new DPs in response to the contracting parties’ needs could become urgent, especially as some regions identified a number of challenges with diagnosis of pests. The panel agreed on a preliminary list of eight pests, pests identified by the IRSS surveys, pests that currently have no regional DPs developed, and emerging pests with global concerns. A globally agreed diagnostic protocol may be needed for them.
7. The panel agreed that the members would prepare summaries on these pests for the discussion and assessment at the next face-to-face TPDP meeting.
8. The TPDP was informed that ISO was developing the standard *General requirements for molecular biology analysis for detection and identification of destructive organisms in plants and derived products*, which overlapped with some of the work of the IPPC in relation to diagnostic protocols.
9. The TPDP reviewed and agreed on their work plan for 2016-2017[[14]](#footnote-14). The panel briefly discussed the importance of the TPDP work. Regarding benefits, the major one identified was that the IPPC diagnostic protocols are global standards scrutinized by all IPPC contracting parties, with consensus reached on reliable diagnostic methods (sensitivity, specificity and reproducibility globally harmonized), which should help to minimize disputes. The panel felt that more discussion on the challenges and importance of the TPDP would be beneficial, and agreed to discuss this in the future.

2016 TPDP September virtual meeting

1. The main focus of the meeting was the TPDP response to the objection[[15]](#footnote-15) received during the 01 July – 15 August 2016 DP Notification period to the adoption of the draft DP for *Tomato spotted wilt virus* (TSWV*), Impatiens necrotic spot virus* (INSV) and *Watermelon silver mottle virus* (WSMoV) (2004-019).
2. In response to the comments submitted in the objection the discipline lead explained that some of the tests described in the draft DP may have been outdated, as the draft was finalized before the new research became available. The panel discussed the responses to objection comments and the necessary modifications to the draft DP and agreed to send comments to the discipline lead who would finalize the responses and revise the draft DP.
3. The Secretariat updated the panel on the status of draft DPs under the TPDP work programme.

2017 TPDP February meeting (Rome, Italy)[[16]](#footnote-16)

1. The following draft DPs were reviewed in detail:
* Revision of DP 2: *Plum pox virus* (2016-007)
* *Bactrocera dorsalis* complex (2006-026
* *Conotrachelus nenuphar* (2013-002)
* *Ips* spp. (2006-020)
1. The panel was updated on the relevant discussions by CPM Bureau and the SC November meetings, i.e. CPM Bureau decision that progressing large number of draft DPs should be spread over a four-year period to reduce the impact on the Secretariat resources; about the IRSS survey on the use of the DPs and the SC’s request to the TPDP to present an analysis of the consequences of updating or not updating a DP whenever a revision of a DP is proposed. The TPDP noted that if the work of the TPDP is phased out, the teams of authors may be lost and be extremely difficult to rebuild. The TPDP reiterated that in their countries and regions they do use IPPC DPs and rely on IPPC standards and other material to secure coordinated effective action to prevent, and to control the introduction and spread of plant pests. It was mentioned that for some regions there is not enough capacity to develop regional standards and specially DPs.
2. The Secretariat presented a general overview of the TPDP work programme, indicating draft DPs that are planned to be submitted in 2017 for the Expert Consultations, for the consultation of draft ISPMs or for the DP notification periods. The panel reviewed the draft DPs on the TPDP work programme, noting those recently adopted by the SC on behalf of the CPM[[17]](#footnote-17).
3. The panel continued discussions on the following horizontal issues relating to the phytosanitary diagnostics:
* Controls and interpretation of results of ELISA tests
* Control options for molecular tests for pest group categories
* Best practices for DNA sequencing
* Quality assurance for DPs
* NGS as a diagnostic tool

In relation to the use of NGS, it was emphasized the differences between NGS and conventional sequencing. It was explained that conventional sequencing is usually based on searching for a pest-specific part of DNA, whereas NGS may be non-targeted (multiplex) and can detect “everything” that is present. Thus, NGS may lead to misinterpretation. NGS also allow for testing and detection of presence of foreign DNA in a symptomless plant. The panel drafted a document on options for the use of this technique for the detection and identification of plant pests outlining the challenges of these technologies as a diagnostic tool. The TPDP also made some recommendations and invited the SC to consider the document, and to inform the CPM on the challenges associated with these new technologies (see paper 08\_SC\_2017\_May).

The TPDP discussed and assessed the need for the development of DPs for eight pests identified at the previous meeting. The panel agreed that the development of an IPPC DP for the following pests would be beneficial:

* *Citrus leprosis virus*
* *Pyricularia oryzae* (syn. *Magnaporthe oryzae*)on *Triticum* spp.
* *Microcyclus ulei*
* *Mononychellus tanajoa*
* *Puccinia graminis* f.sp. *tritici* UG 99
* *Moniliophthora roreri*

The TPDP was updated by the invited expert on the development of regional diagnostic protocols by EPPO. The panel noted work done by EPPO on the NGS and on the accreditation of phytosanitary laboratories.

One TPDP member informed the panel that the ISO standard ISO/TC 34/SC 16/13484: *Molecular Biomarker Analysis: General requirements for molecular biology analysis for detection and identification of plant pests* was under the adoption process. The standard may be an alternative for the widely used ISO 17025, less stringent and focused specifically on the analysis of plants. The standard does not cover morphological methods.

The TPDP reviewed their work plan for 2017-2018 and noted that at the TPDP 2018 February face-to-face meeting the panel should have a strategic discussion on the future work of the panel.

The TPDP discussed the second objection[[18]](#footnote-18) to the adoption of the draft DP for *Tomato spotted wilt virus, Impatiens necrotic spot virus* and *Watermelon silver mottle virus* (2004-019) received in January 2017 during the DP notification period. The panel discussed the justification for the objection and agreed that the discipline lead would prepare the response to the objection and revise the draft DP accordingly and a final TPDP decision would be via electronic means.

4. Tentative work plan for the period May 2017 – April 2018

1. The next face to face meeting will be convened in Paris, France, on 05 – 09 February 2018. The venue for the meeting will be the headquarters of EPPO. The tentative agenda covers an in-depth discussion of three draft DPs and discussion on the future activities of the TPDP.
2. The TPDP will continue to work on the 13 draft DPs remaining on the work programme. It is hoped that they will all be submitted for adoption by 2019.
3. The TPDP tentative work plan for May 2017 – April 2018 is summarized in Figure 2.

**4.1 Expert Consultations on draft Diagnostic Protocols**

1. Two expert consultations are tentatively planned to take place in the 3rd and 4th quarter of 2017 for four draft diagnostic protocols.

**Recommendations to the SC:**

1. The SC is invited to:
2. *note* the following meeting reports: 2016 TPDP July meeting report, 2016 TPDP September virtual meeting report and 2017 TPDP February meeting report;
3. *consider* the TPDP discussions on DPs and viability of pests (section 7.6 of the TPDP July 2016 meeting report);
4. *note* the TPDP tentative work plan for May 2017 – April 2018 (summarized in Figure 2);
5. *note* the revised TPDP Instructions to authors of diagnostic protocols (posted on IPP[[19]](#footnote-19) on the TPDP webpage);
6. *note* the TPDP recommendations on the need to develop new diagnostic protocols;
7. *consider* the TPDP discussion paper on the use of the next generation sequencing as a diagnostic tool in the phytosanitary area (see paper 08\_SC\_2017\_May).
1. TPDP main page on IPP: <https://www.ippc.int/en/core-activities/standards-setting/expert-drafting-groups/technical-panels/technical-panel-diagnostic-protocols/> [↑](#footnote-ref-1)
2. List of topics for IPPC standards: <https://www.ippc.int/en/core-activities/standards-setting/list-topics-ippc-standards/> [↑](#footnote-ref-2)
3. Consultation on draft ISPMs: <https://www.ippc.int/en/core-activities/standards-setting/member-consultation-draft-ispms/> [↑](#footnote-ref-3)
4. DP notification period: <https://www.ippc.int/en/core-activities/standards-setting/draft-ispms/notification-period-dps/> [↑](#footnote-ref-4)
5. Expert consultation on draft DPs: <https://www.ippc.int/en/core-activities/expert-consultation-draft-diagnostic-protocols/> [↑](#footnote-ref-5)
6. IPPC Diagnostic Protocols (DPs) drafting groups: <https://www.ippc.int/en/publications/2582/> [↑](#footnote-ref-6)
7. Instructions to Authors of Diagnostic Protocols: <https://www.ippc.int/en/core-activities/standards-setting/expert-drafting-groups/technical-panels/technical-panel-diagnostic-protocols/> [↑](#footnote-ref-7)
8. Brochure: An Introduction for Authors of IPPC Diagnostic Protocols: <https://www.ippc.int/largefiles/IPPC_IntroToAuthors_e_W.pdf> [↑](#footnote-ref-8)
9. Reports of the TPDP meetings: <https://www.ippc.int/en/core-activities/standards-setting/expert-drafting-groups/technical-panels/technical-panel-diagnostic-protocols/> [↑](#footnote-ref-9)
10. TPDP February 2017 meeting report: not yet available. [↑](#footnote-ref-10)
11. CPM 2017/22: Report on the activities of the Standards Committee: <https://www.ippc.int/en/publications/84000/> [↑](#footnote-ref-11)
12. IPPC news item on “Harmonizing the IPPC diagnostic protocols to protect plant resource and to facilitate trade”: <https://www.ippc.int/en/news/harmonizing-the-ippc-diagnostic-protocols-to-protect-plant-resource-and-to-facilitate-trade/> [↑](#footnote-ref-12)
13. Specification TP 1 - Technical Panel on Diagnostic Protocols: <https://www.ippc.int/en/publications/1297/> [↑](#footnote-ref-13)
14. TPDP work plan 2016-2017 can be found in Appendix 4 of the 2016 July TPDP meeting report at <https://www.ippc.int/en/publications/82977/> [↑](#footnote-ref-14)
15. Link to the objection received: <https://www.ippc.int/en/publications/82787/> [↑](#footnote-ref-15)
16. IPPC news item on “The Annual Meeting of the IPPC Technical Panel on Diagnostic Protocols (TPDP) Held at FAO”: <https://www.ippc.int/en/news/the-annual-meeting-of-the-ippc-technical-panel-on-diagnostic-protocols-tpdp-held-at-fao/> [↑](#footnote-ref-16)
17. IPPC news item on “Global diagnostics for plant pests - five new IPPC diagnostic protocols adopted”: <https://www.ippc.int/en/news/global-diagnostics-for-plant-pests-five-new-ippc-diagnostic-protocols-adopted/> [↑](#footnote-ref-17)
18. Link to the objection: <https://www.ippc.int/en/publications/83990/> [↑](#footnote-ref-18)
19. TPDP Instructions to Authors: <https://www.ippc.int/en/publications/1180/> [↑](#footnote-ref-19)