REPORT

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Technical Panel on Diagnostic Protocols (TPDP) July, 2016

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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1. Opening of the meeting

1.1 Welcome remarks

[1] The Chief Technical Director from the Ministry of Industry, Commerce, Agriculture and Fisheries of Jamaica, Mr Demon SPENCE, opened the meeting and gave a warm welcome to all the participants. He highlighted how important the work on diagnostic protocols (DP) is as the International Plant Protection Convention (IPPC) is the only standard setting organization for plant health recognized by the World Trade Organization (WTO).

[2] The Chief Plant Quarantine/Produce Inspector of Jamaica, Ms Sanniel WILSON, also welcomed everyone to Jamaica on behalf of the Plant Quarantine/Produce Inspection division. She explained that this is a research and development division, which supports the work of the Jamaican National Plant Protection Organization (NPPO). She mentioned that the NPPO's work to protect agriculture and natural resources from pests is challenging and that they are very keen to see the outcomes of this meeting, as DPs are crucial to helping them do their work and also helps in achieving the IPPC mission. She highlighted the enormous volume of work carried out by the TPDP in previous years and that Jamaica would certainly benefit from this.

[3] Mr Donovan STANBERRY, Permanent Secretary of the Jamaican Ministry of Industry, Commerce, Agriculture and Fisheries highlighted the importance of protection against plant pests, mentioning incursions of the "citrus greening disease" (*Candidatus* Liberibacter spp.) and the assistance that had been obtained from the Inter-American Institute for Cooperation on Agriculture (IICA). He looked forward to learning of the discussions on the draft DP on this disease, citrus greening, and mentioned that a timely and correct identification of pests is fundamental to facilitating trade.

[4] The IPPC Secretariat (hereafter "Secretariat"), welcomed the participants to the eleventh meeting of the TPDP, noting that Ms Liping YIN (China) was not able to attend. The Plant Quarantine Produce Inspection Branch of the Jamaican NPPO were thanked for hosting and co-organizing the meeting and the United States of America (USA) for the in-kind staff contribution to support this meeting.

[5] The Secretariat stressed that IPPC DPs provide minimum requirements for a reliable diagnostic that can be implemented by all contracting parties, especially developing countries[1]. It was highlighted that the purpose of harmonized DPs is to support efficient phytosanitary measures in a wide range of circumstances and to enhance the mutual recognition of diagnostic results by NPPOs, which may also facilitate trade. Furthermore, these protocols aid the development of expertise and technical cooperation on a global scale.

[6] The participants introduced themselves briefly.

1.2 Election of the Chairperson

[7] Mr Norman BARR (USA) was elected Chairperson.

1.3 Election of the Rapporteur

[8] Mr Hans DE GRUYTER (Netherlands) was elected Rapporteur.

1.4 Adoption of the Agenda

[9] The Agenda was adopted after adding a point under "any other business" on horizontal issues for diagnostics (Appendix 1).

[1] As per July 2016, the IPPC has 182 contracting parties (75% represented by developing countries)

2. Administrative Matters

[10] Ms Juliet GOLDSMITH (Jamaica / Caribbean Agricultural Health and Food Safety Agency (CAHFSA)), introduced the Local information document[2]. The Secretariat introduced the Documents list (Appendix 2) and the Participants list (Appendix 3). Documents referenced in this report are available only to TPDP members. The participants were reminded to update any changes to their contact information on the International Phytosanitary Portal (IPP – www.ippc.int) as the information will be reflected in the TPDP membership list[3].

3. Scrutiny of draft diagnostic protocols

[11] The TPDP reviewed four draft DPs reported in the individual sections below. Two draft DPs had been submitted to expert consultation[4] in 2016. The draft DPs for Begomoviruses transmitted by *Bemisia tabaci* (2006-023) and *Xylella fastidiosa* (2004-024) are tentatively planned to be submitted in the fourth quarter of 2016. For all four draft DPs, discipline leads will work with the respective DP drafting group[5] to revise the drafts after this meeting, and the modified drafts will then be submitted to the SC, via electronic decision tools, with the recommendation to be approved for consultation.

[12] From the discussions, it was recalled that the International Standard for Phytosanitary Measures (ISPM) 27 (*Diagnostic protocols for regulated pests*)[6] states that DPs contain the minimum requirements for reliable diagnosis of the specified regulated pests and provide flexibility to ensure that methods are appropriate for use in the full range of circumstances. Countries can use their own methods as long as they are technically justified, and that this is mentioned in the disclaimer in all diagnostic protocols. It was noted that the methods included in DPs are selected on the basis of their sensitivity, specificity and reproducibility. It was stressed that, if there are more validated methods available, the most common method used by NPPOs should be taken into consideration. It was also noted that once adopted DPs are revised some of the methods may also change. Lastly, it was pointed out that IPPC protocols should include a detailed written validated method, rather than describe all the possible protocols from the associated literature.

[13] The following general comments were made in reference to all draft DPs discussed at the meeting:

- DPs should follow the TPDP *Instruction to Authors* and the IPPC Style Guide.
- Experts who make significant contributions during the expert consultation period will be recognized in the DP status box.
- Regarding the loop-mediated isothermal amplification (LAMP) method, it was noted that this method may require licenses in specific countries and regions. This point was also raised in a consultation comment. Additional guidance on the use of LAMP for diagnosis purposes was included in the Instructions to Authors as a footnote for every mention to LAMP, as follows:

  "When using LAMP on a regular basis in an area which has a patent system such as Japan (Patent Nos. 3,313,358, 3,974,441 and 4,139,424), the United States of America (US6,410,278, US6,974,670 and US7,494,790), the European Union (Nos. 1,020,534, 1,873,260, 2,045,337 and 2,287,338), China (ZL008818262), the Republic of Korea (Patent No, 10-0612551), Australia (No. 779160), and the Russian Federation (No. 2,252,964), it is necessary for users to receive a license from Eiken Chemical Co., Ltd. before use."

[2] 02_TPDP_2016_Jul_Rev

[3] TPDP membership list: https://www.ippc.int/en/publications/1181/

[4] Expert consultation on draft DPs: https://www.ippc.int/core-activities/expert-consultation-draft-diagnostic-protocols

[5] IPPC DPs drafting groups: https://www.ippc.int/en/publications/2582/

[6] IPPC adopted ISPMs: https://www.ippc.int/en/core-activities/standards-setting/ispms/

- Permissions to use illustrations (including figures and pictures) in DPs should be requested by the Secretariat after having received all necessary information from discipline leads. This change in procedure was deemed necessary to have proper records of the permissions.
- Controls should always be provided and the minimum controls required should be clearly indicated. The TPDP pointed out that there is a need for further guidance on controls for enzyme-linked immunosorbent assay (ELISA) tests as this is a horizontal issue relevant to all diagnostic protocols. It was agreed that a paper should be developed for further discussion on this.

[14] The TPDP:

(1) *agreed* that Mr Robert TAYLOR, lead (New Zealand) and Ms Geraldine ANTHOINE (France) would develop a paper on ELISA controls and interpretation of results for the 2017 TPDP face-to-face meeting.

3.1 *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010) (Priority 2)

[15] The discipline lead, Mr Brendan RODONI (Australia), introduced the draft diagnostic protocol[7], the summary of comments from the expert consultation[8] and the checklist for discipline leads and referees[9]. He noted that five experts provided comments during the expert consultation.

[16] He mentioned that most of the comments provided during the expert consultation were editorial and had been incorporated into the draft.

[17] He noted that there was a comment suggesting to include a new direct Polymerase Chain Reaction (PCR) test from a specific literature reference, which had not been incorporated because there was not sufficient validation data. The new direct PCR test had only been validated on lemons, and was therefore not broadly applicable yet.

[18] Another comment suggested reducing the emphasis given to electron microscopy. The lead pointed out that this is a useful tool for initial screenings and that it is used frequently by some countries, although he also recognized that the technique may have some implementation challenges due to, for instance, the high cost of the equipment. It was stressed that *Ca.* Liberibacter spp. is a non-cultivated bacterium, and that electron microscopy is useful also for this reason. In addition, electron microscopy was not part of the minimum requirements for detection or identification in the diagnostic protocol, but described as additional information and a useful option for contracting parties.

[19] One comment had suggested to include the novel subspecies of *Ca.* Liberibacter africanus in alternative hosts. It was explained that they had not been added because they had not been proven to cause diseases in commercial citrus fruits, and therefore were not yet linked to the "citrus greening disease". The TPDP recommended adding a paragraph to explain that these new subspecies of *Ca.* Liberibater africanus were described in potential alternate hosts, but that they could be potential reservoirs, although they had not yet been demonstrated to be associated with the disease on citrus.

[20] The TPDP discussed the following specific points:

[21] Pest information. Some TPDP members noted that information on the detection of *Ca.* Liberibacter asiaticus in two insects was mentioned, but the information supporting that these insects were vectors was not clear. The TPDP recommended the DP drafting group provide clarification on whether these two insects are indeed potential vectors of *Ca.* Liberibacter asiaticus.

[7] 2004-010

[8] 18_TPDP_2016_Jul

[9] 19_TPDP_2016_Jul

[22] Taxonomic information. Some TPDP members queried if, for diagnostic purposes, all the information (e.g. the history of the taxonomic position) contained in this section was needed. The TPDP recommended the DP drafting group consider reducing the text. Regarding common names of the disease, the section was reduced to the main two common names (Huanglongbing ("HLB"), or citrus greening) and a literature reference was provided for other common names including other languages than English.

[23] Detection and identification. Some TPDP members felt that the minimum requirements were not clear in the draft diagnostic protocol. The TPDP recommended to clarify the minimum requirements for detection and identification, and to divide the sections accordingly for clarity. It was also recommended to add a reference for positive control, if available.

[24] One TPDP member queried the sensitivity data for PCR tests. It was clarified that the issue for *Ca.* Liberibacter spp. is the irregular distribution in the host, not necessarily the sensitivity of conventional PCR or real-time PCR. The TPDP noted that real-time PCR can detect the pathogens in symptomless plants and agreed that this should be reflected in the text as well as in the flow diagram.

[25] Symptoms. Some TPDP members suggested to include illustrations of symptoms as this is important for diagnosis, especially the "irregular symptoms" (sectorial symptoms) in a plant, typical from *Ca.* Liberibacter species. The TPDP agreed that the inclusion of illustrations of symptoms was very useful, but stressed that symptoms are not enough to confirm infection by *Ca.* Liberibacter spp in a citrus plant.

[26] Biological detection (graft transmission). One member queried if grafting is enough to perform a detection diagnosis and if it should be a minimum requirement. The TPDP had different views and could not reach an agreement, as grafting is usually performed as a confirmatory test for first detections (e.g. first detection in a country) followed by another test (e.g. PCR). The TPDP asked the DP drafting group to clarify this issue and consequently adjust the flow diagram for the minimum requirements to perform the diagnosis.

[27] Electron microscopy. The discipline lead stressed that transmission electron microscopy (TEM) is important as an alternative to molecular tests, even though if is not widely used (see also above discussions on this point). The TPDP agreed to include this but added wording to clarify that electron microscopy is an alternative to molecular tests. The TPDP also recommended the DP drafting group to adjust the flow diagram accordingly.

[28] Sampling and sample preparation. The TPDP queried about the sample size for laboratory use and the reference cited as there were differences in the numbers of leaves in the sample in various literature. The TPDP also queried if all leaves should be symptomatic or not. The TPDP asked the DP drafting group for further clarification.

[29] DNA extraction. The TPDP deleted some of the qualitative wording in this section (e.g. "the yield and quality of the DNA") as it was not deemed suitable for the protocol and because it is general practice in a laboratory. The panel recommended adding a statement on the reasons why the methods on DNA extraction were included in the draft DP, for example due to sensitivity data of the method. The TPDP also recommended to verify this information in the draft DP for *Ca.* Liberibacter solanacearum (2013-001), currently out for consultation[10], as similar methods were described.

[30] The TPDP also pointed out that if there were specific differences between different methods given by different manufacturers of commercial kits, then these should be described in the draft diagnostic protocol.

[10] July 2016 Consultation on draft ISPMs: https://www.ippc.int/en/core-activities/standards-setting/member-consultation-draft-ispms/

[31] Conventional PCR. The TPDP asked the DP drafting group to clarify if both references given for detection "in planta" and "in vector" used the same primer sequences and same PCR reaction conditions. The TPDP also asked the DP drafting group to provide information on the specificity and sensitivity data for each test. Also, the TPDP asked the DP drafting group to provide information on performance tests data for conventional PCR, as it was missing. This information should be included before the description of the primers. It was noted that there was a section on "specificity and sensitivity" and that this information should be placed there.

[32] According to the Instruction to Authors, the titles of the sections should be adjusted, meaning that the references should be given in the paragraph below the section title. The TPDP also noted that the PCR conditions should be converted into a table format. It was noted that some of the PCR cycling programs did not match those of the cited references. The TPDP agreed that the DP drafting group should verify and clarify if the PCR cycling program referred to the original reference or if it was an adapted program.

[33] The TPDP discussed whether restriction fragment length polymorphism (RFLP) followed by PCR is a detection or identification test. The TPDP also discussed the minimum requirements for first detection of the bacteria in an area, i.e. if a confirmatory test such as RFLP (which is different for routine detection) is required in addition to conventional PCR. It was noted that RFLP is generally used in circumstances when there is no access to sequencing, thus the RFLP could then be considered an identification test. After a lengthy discussion on the minimum requirements for diagnosis, the overall agreement on first detections when using RFLP was that a confirmatory test would be required. Nevertheless, the TPDP asked the DP drafting group to clarify this better in the draft DP and adjust the flow diagram accordingly.

[34] Real-time PCR. The TPDP noted that although several references were given, no performance data were provided. The TPDP discussed the specificity and sensitivity of the different tests and agreed to seek clarification from the DP drafting group on this. One TPDP member queried the need for more than one test if the primers amplify the same gene (16S rRNA gene). The TPDP agreed that the DP drafting group should provide clarification on the method of choice and the specificity.

[35] Loop-mediated isothermal amplification (LAMP). The TPDP expressed concerns on the requirement to analyze the LAMP reaction by electrophoresis because the controls for LAMP would be the same as for conventional PCR. The TPDP asked the DP drafting group for clarification on the need for this requirement. The generic footnote on the use of LAMP for specific countries and regions where there may be need for a license was included (see general comments above).

[36] Controls. The TPDP noted that control for positive amplification and positive extraction should be added to the draft diagnostic protocol. One TPDP member queried if healthy psyllids were only obtained from the hosts described, and whether the cytochrome oxidase gene (COX) primer was for plants or for vectors, noting that if it were for vectors appropriate controls should be included. These controls should be addressed in the draft diagnostic protocol.

[37] Interpretation of results. Some TPDP members queried whether it was acceptable for the sample to be considered negative if there were bands of different sizes, including the expected size of the PCR generated DNA fragments, as there was no guidance on this. It was explained that, in the case of some conventional PCR tests, some "unspecific" bands are produced. However, it was stressed that the sample was considered negative when a band of the expected size would not be produced. As a matter of consistency across diagnostic protocols, the text was adjusted to state that the sample is considered negative when a band of the expected size is not produced. It was agreed to also add this to the TPDP *Instruction to Authors*.

[38] In regards to real-time PCR, the TPDP noted that the interpretation of results for vectors was missing and asked the DP drafting group to include information on this.

[39] Specificity and sensitivity. The TPDP suggested the DP drafting group to move the information contained in this section into the text alongside each test description.

[40] DNA sequencing. The TPDP noted that the information in this section should be placed before the explanation on molecular methods and minimum requirements, because sequencing is recommended for first detections and identifications in an area. It was also noted that some information on sequence analysis, such as similarity between sequences and reference specimen was missing and the TPDP recommended that this be included in the text.

[41] Flow diagram. Since the minimum requirements needed to be better explained in the draft, the flow diagram needed to be revised accordingly.

[42] Acknowledgements. It was noted that Mr Joseph Marie Bové, Ph.D., from Laboratoire de Biologie Cellulaire et Molèculaire, Institut de Biologie Végétale Moléculaire (IBVM) Centre Recherche INRA Bordeaux, France, expert who revised this draft DP recently passed away. The TPDP expressed immense thanks to the late Mr Joseph Marie Bové for his contributions to the draft DP for *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010).

[43] The TPDP:

(2) *invited* the DP drafting group to consider the TPDP recommendations and consequently adjust the draft diagnostic protocol for *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010). Following this, the draft diagnostic protocol will be reviewed by the TPDP via e-decision for recommendation to the SC for approval for consultation.

3.2 *Puccinia psidii* (2006-018) (Priority 2)

[44] The discipline lead, Mr Hans DE GRUYTER (Netherlands), introduced the draft DP[11], the summary of comments from experts received during the expert consultation[12] and the checklist for discipline leads and referees[13]. He noted that four experts had provided comments during the expert consultation, and thanked them for their help in improving the draft diagnostic protocol. He expressed deep thanks to the DP drafting group and the lead author.

[45] The discipline lead pointed out that most of the comments made during the expert consultation were incorporated. Some of these comments were on pest taxonomy and real-time PCR. He noted that most of them had been prompted by recent findings (i.e. new publications) and that they had been included in the draft diagnostic protocol. He mentioned that there were several comments on the flow diagram and that the DP drafting group had adjusted it to reflect the comments.

[46] However, some comments were not incorporated in the draft diagnostic protocol, such as:

- Suggestion to expand host range to non-native species was not incorporated because there was not enough evidence to support this.
- Suggestion to include other common names was not agreed to as this would not be consistent with the IPPC Style guide.

[47] From the referee's checklist, it was pointed out that the Centre for Agriculture and Biosciences International (CABI) has a database with more than 400 host species and the referee felt this reference should be included in the draft; the TPDP agreed. The referee also suggested to include more guidance on sources of reference material for positive controls. The TPDP adjusted the text accordingly. The referee

[11] 2006-018
[12] 08_TPDP_2016_Jul
[13] 09_TPDP_2016_Jul

also suggested including more information on sensitivity and specificity data for the nested PCR and real-time PCR. The discipline lead explained that most of this information, on sensitivity and specificity, was not available, and therefore had not yet been incorporated. The TPDP pointed out that more guidance on host identification should be included, as most rust fungi are host specific. It was explained that the flow diagram was adjusted to include this requirement, i.e. host identification, to ensure that the diagnosis was sound.

[48] The TPDP discussed the following specific points:

[49] Pest information. It was noted that plants belonging to genus *Heteropyxis* now have a new taxonomic classification; it is now a genus within the Myrtacea family. To avoid confusion, text was adjusted to better reflect this taxonomic change and indicate that this genus was included in the scope of the DP.

[50] One TPDP member noted that the word "established" was used to refer to when an infestation occurs but could cause confusion as it was not used according to the definition of the term in ISPM 5 (*Glossary of phytosanitary terms*). The text was adjusted.

[51] Synonyms. It was explained that due to the high number of host plants, a long list of synonyms was provided. The TPDP agreed to keep the synonyms as it was deemed helpful.

[52] Detection. The discipline lead noted that during the drafting stage there were several discussions on whether morphological observations may lead to a final diagnosis. The TPDP clarified the issue stressing that for *P. psidii* morphological observations may lead to either a final diagnosis or a further study with additional molecular methods (see "morphological detection" below), depending on the purpose of the diagnosis (e.g. first detection in a country). It was agreed that the flow diagram should be adjusted to reflect this.

[53] Some TPDP members queried whether sequencing was necessary to allow for proper detection or identification. It was explained that sequencing is necessary for final identification. The text was adjusted to reflect this.

[54] The TPDP requested clarity on how to perform diagnosis of the pest when it was collected from an unknown plant species. As this draft had been developed based on tests for plants within the Myrtaceae family (this was reflected in the flow diagram by showing the need for proper host identification as a minimum requirement - at least at family level), the TPDP queried whether to adjust the scope of this draft DP to "*P. psidii* on Myrtaceae". The discipline lead would discuss with the DP drafting group how to address this concern. In the meantime, the panel decided not to change the scope.

[55] Symptoms. The panel suggested including specific examples of economically important crops affected by *P. psidii* and its symptoms, to better illustrate the economic importance of this pest.

[56] Morphological detection. The TPDP stressed that because rust fungi have a high dispersal contamination potential, it should be handled with care and in restricted conditions. Text was added to better explain that rust fungi can spread easily and samples should be handled carefully to prevent the spread of the pest especially if the pest has not been reported before; in such cases (i.e. the pest has not been reported before) the samples should be handled under quarantine laboratory conditions.

[57] The TPDP made some comments on the need to clarify the minimum requirements for detection and identification using morphological tests. It was explained that morphology could be performed as a final diagnosis. Nevertheless, in some cases a molecular test, i.e. sequencing, would be needed. Therefore, to add clarity on the minimum requirements for detection and for identification, the TPDP agreed to reorganize the sections to better reflect how the diagnosis was performed in practice and to adjust the flow diagram accordingly.

[58] The TPDP noted that there were several mentions of "specimen" whereas the TPDP agreed the correct term to use was "sample".

[59] The TPDP agreed to have a description of the character "paraphyse" as it is a key morphological character for the detection of *P. psidii*.

[60] Molecular detection. As a general comment, the TPDP agreed that this section should be revised to reflect the minimum requirements for detection and identification. Some asked for more clarification on the statement (according to a publication) that molecular methods had been developed to detect *P. psidii* in plant material and also in "other material", referring to non-plant material. It was asked if the tests outlined in the draft diagnostic protocol were appropriate for these "other material" or if additional tests would need to be described. The TPDP also agreed adding some information to highlight the importance and potential risks of this "other material" (i.e. non-plant material).

[61] Conventional PCR. One TPDP member queried the necessity of this test because it was non-specific and because other tests described were species-specific. It was explained that this test is commonly used for detection of any fungi and that it is used to generate fragments for sequencing. It was noted that, if this is the reason to perform such a test, it should be placed under the identification section, hence sequencing was identified to be the minimum requirement for identification.

[62] Some TPDP members noted that sensitivity data was not provided. The TPDP recommended to include sensitivity data and if they were not available, a statement should be included instead.

[63] Another TPDP member queried the minimum requirements on the primer pairs to be used for sequencing and whether the internal transcribed spacer (ITS) gene region sequence would suffice. The TPDP acknowledged that it was better to have other gene region sequences besides the ITS. It was recommended to include those gene regions with more sequences available in a database for comparisons.

[64] Real-time PCR. The TPDP noted that information on specificity was missing and should be provided to better demonstrate the robustness of the test. It was explained that there was not enough information to include this, but that there was evidence for specificity against seven other *Puccinia* species. For other species there was some phylogenetic information that could be provided to help see the pattern and better address the specificity in the real-time PCR test.

[65] Controls. The TPDP suggested clarifying the minimum requirements of controls. The panel suggested including a note to state that in the case of plant material, a positive extraction control was required and, when using real-time PCR and nested PCR an additional internal control was required. The TPDP noted that if an internal control for nested PCR would be added, guidance on the use of the primers (e.g. if for sequencing) should be provided.

[66] Interpretation of results. The TPDP noted that this section was missing in the draft and asked the DP drafting group to include it.

[67] Identification. Some TPDP members felt that this section was too directive to NPPOs and the TPDP agreed to adjust the wording.

[68] Once again, some TPDP members queried if morphological characteristics may help identify the pest. It was explained that in most of the cases it would be possible; but in cases of findings in areas or new hosts, where it had not been found before, other tests such as sequencing should be performed. It was pointed out that a new rust fungus was described to be infecting Eucalyptus species and that it had morphological characters that overlap with *P. psidii*. The TPDP again stressed the need to clarify situations where morphological characteristics may identify the pest and to revise the flow diagram accordingly.

[69] Molecular identification. Regarding the minimum requirements for barcoding and the number of gene regions, the TPDP queried how many gene regions were necessary; if the minimum requirement was ITS gene plus another house-keeping gene or, if ITS would suffice. The TPDP requested clarification from the DP drafting group.

[70] Some TPDP members commented on the data to be used on chromatograms and this should be added or a reference source provided to ensure high quality data.

[71] Some TPDP members questioned the percentage of sequence similarity to be able to identify the pest correctly. The TPDP recommended to add a source as well as to clarify possible intraspecific sequence variations more effectively.

[72] Flow diagram. Since the minimum requirements for detection and identification needed clarification, the flow diagram needed to be revised.

[73] The TPDP:

(3) *invited* the DP drafting group to consider the TPDP recommendations and consequently adjust the draft diagnostic protocol for *Puccinia psidii* (2006-018). Following this, the TPDP will review the draft diagnostic protocol via e-decision for recommendation to the SC for approval for consultation.

3.3 Begomoviruses transmitted by *Bemisia tabaci* (2006-023) (Priority 2)

[74] The discipline lead, Mr Brendan RODONI (Australia), introduced the draft diagnostic protocol[14] and the checklist for discipline leads and referees[15]. He noted that some co-authors had recently been selected by the TPDP.

[75] It was noted that this draft still required some editorial modifications to make it less regional and more global. The tables with PCR conditions and the references should also follow the style in the *Instruction to Authors* (i.e. tables should include appropriate titles and web links in the core text should be avoided).

[76] The TPDP stressed that the scope of this draft diagnostic protocol was to perform diagnosis of the genus Begomovirus transmitted by the whitefly *B. tabaci*. If there was a need to include complimentary tests to diagnose at species level, the DP drafting group should add them. The TPDP queried about ELISA tests, as this serological method was not included in the draft. It was explained that ELISA was not included probably because it would not detect all Begomovirus species in the genus. The TPDP agreed that this issue should be clarified with the DP drafting group.

[77] It was also noted that this draft diagnostic protocol was not a comprehensive review of all methods available for the diagnosis of begomoviruses transmitted by *B. tabaci* and that information on detection of the virus in the vector should be included in the draft. The TPDP found that the minimum requirements for a positive diagnosis were missing in the draft and, needed to clarity to differentiate better between detection and identification.

[78] One TPDP member queried if Begomovirus are seed-transmitted. It was explained that there have been some recent publications about a few species being seed-transmitted. The TPDP recommended the DP drafting group to review this issue and include references.

[79] The TPDP also discussed the following specific points:

[14] 2006-023

[15] 16_TPDP_2016_Jul

[80] Symptoms. The TPDP recommended including illustrations of the most typical symptoms, regardless of the species as the scope was for the genus. Also, the TPDP suggested to provide reference to databases where symptoms / figures / descriptions could be found.

[81] Extraction of DNA. One TPDP member pointed out that there were other ways to grind samples to perform DNA extraction than those described, and the TPDP recommended the text should be more generic. The TPDP also agreed that data on validation of methods should be included.

[82] Virus detection. It was noted that unpublished data was mentioned and that, according to the *Instruction to Authors*, this should be removed or clarified, if necessary.

[83] Molecular detection and identification. The TPDP noted that there was no description of a real-time PCR test described in this draft and queried if it should be mentioned. It was noted that perhaps real-time PCR tests were only available for a specific virus, nevertheless, the TPDP agreed that information should be provided, either as a general statement that there are real-time PCRs available or by including specific tests.

[84] Conventional PCR for Begomovirus. The TPDP noted that the described PCR and primers might not detect some species of Begomovirus, as mentioned later in the draft DP. In addition, one TPDP member pointed out that the primers described did not detect Begomovirus in potatoes. The TPDP recommended to include additional primer sets and suggested to include a table with all species of Begomovirus that can be detected with the primers described to give more guidance in the diagnostic protocol.

[85] Conventional PCR for detection of Begomovirus infecting tomato and legumes. The TPDP asked for more information on the reasons to include tests specifically for tomatoes and legumes. It was acknowledged that Begomovirus has a broad host range infecting mainly *Solanaceae, Fabaceae* and *Cucurbitaceae*; however, the TPDP still felt that additional information, including validation data, would be helpful.

[86] Conventional PCR for detection of beta satellites. The TPDP also asked for more information on the reasons for including this test, since beta satellites are not associated with all Begomovirus species and may therefore not be a good indicator for a minimum diagnosis requirement. The TPDP recommended that, if the DP drafting group feels it was a minimum requirement for diagnosis and wished to retain this test, additional information on beta satellites and their importance for diagnosis should be provided in the pest information section.

[87] Rolling-circle amplification (RCA). One TPDP member queried if RCA would be a good detection tool since it can detect all single-strand DNA (ssDNA) viruses, not only Begomovirus. The TPDP felt that the guidance was to perform a RFLP, or sequencing for identification after performing RCA, and not all Begomoviruses have a RFLP pattern. The TPDP once again stressed that minimum requirements for detection and identification should be clarified to provide better guidance for the purpose of each test. Another TPDP member pointed out that the scope of the DP is for the genus *Begomovirus* and suggested that instead of having a specific section on the identification of species, perhaps it would be more suitable to have a section on "additional tests" where RFLP and sequencing tests could be added. The TPDP agreed to keep the RCA test in the draft because it was considered an important tool, and widely used for the identification of the Begomovirus, but also agreed that further explanation on its use should be included in the draft diagnostic protocol.

[88] Regarding the RFLP following the RCA test, the TPPD asked for more information on the conditions to perform it, i.e. enzymes, reagent conditions and restriction patterns. The TPDP also suggested including additional information on the reasons to perform RFLP and sequencing for identification.

[89] Controls for molecular tests. The TPDP pointed out that the minimum requirements on the controls were not clear, just as it was not clear which controls to use for each test. It was noted that the internal control was not described and the TPDP invited the DP drafting group to consider if it was needed. The TPDP also noted that the terminology used in this section should be in line with the *Instructions to Authors* and IPPC Style Guide, and requested the DP drafting group to adjust the text.

[90] Interpretation of results. The TPDP pointed out that this section needed a full revision in accordance with the scope and to clearly distinguish between the tests used for detection and identification. The TPDP also noted that terminology is this section should also be aligned the *Instructions to Authors* and IPPC Style Guide, and requested the DP drafting group to adjust the text.

[91] Virus identification. The TPDP highlighted that also this section needed to be fully revised in accordance with the scope. The TPDP suggested to change the title of this section to "additional tests" if the DP drafting group deemed necessary to keep general guidance on how to undertake identification at the species level. One TPDP member noted that Q-Bank has reference sequences that are recognized by the International Committee on Taxonomy of Viruses (ICTV), and agreed to include a reference to this database.

[92] Flow diagram. The TPDP asked the DP drafting group to reconsider if a flow diagram would be useful. Some TPDP members felt that a flow diagram would provide better guidance on the minimum requirements for diagnosis and for the identification of species specific to tests other than those described in the draft. In any case, the flow diagram should be adjusted to reflect the discussion points and the minimum requirements for diagnosis, differentiating between detection and identification.

[93] The TPDP:

(4) *invited* the discipline lead and the referee to consider the TPDP recommendations and consequently adjust the draft diagnostic protocol for Begomoviruses transmitted by *Bemisia tabaci* (2006-023) and forward it to the DP drafting group for their revision. Following this, the draft diagnostic protocol will be submitted to the expert consultation period. Hereafter, the draft diagnostic protocol will be revised by the DP drafting group and presented to the TPDP via e-decision for recommendation to the SC for approval for consultation.

3.4 *Xylella fastidiosa* (2004-024) (Priority 2)

[94] The discipline lead, Mr Robert TAYLOR (New Zealand), introduced the draft diagnostic protocol[16] and the checklist for discipline leads and referees[17].

[95] The TPDP discussed the fact that none of the co-authors wished to take on the role as lead author, and considered whether a call for authors should be made to address this issue. Due to the advanced stage of development of this draft diagnostic protocol and because of the huge amount of work already done, the TPDP agreed to assign Mr Robert TAYLOR (New Zealand) as the lead author, since he had been heavily involved in the development of the draft. Ms Geraldine ANTHOINE (France) was assigned as discipline lead. Consequently, the TPDP agreed that there was no need to open a call for authors.

[96] The TPDP noted that better figures were expected to be obtained for the expert consultation stage. The TPDP asked to highlight the host range of the different diseases that are caused by *X. fastidiosa*, as this was not evident. The TPDP also recommended to ensure the correct use of terminology for each mention of "isolate" or "strain".

[16] 2004-024
[17] 12_TPDP_2016_Jul

[97] The TPDP noted that additional references should be included and that those included in the draft should be checked, since some of them stemmed from the FAO-IPPC-CIHEAM International Workshop on *X. fastidiosa* and the Olive Quick Decline Syndrome (OQDS) (April 2016, Bari, IT), which had not yet been published.

[98] The TPDP discussed the following specific points:

[99] Pest information. The TPDP agreed not to mention specific countries but instead include reference to areas or regions. The TPDP agreed that some information on the different subspecies and associated host ranges should be included.

[100] Detection. Some TPDP members pointed out that for the description of symptoms a literature reference should be included to provide better guidance.

[101] Sampling of plant material. Some queried the best way to perform sampling; if samples could be collected from any leaves or if should be collected from mature leaves (i.e. not from young shoots). It was noted that diagnostic tests are performed on samples of leaves, but that the leaves would probably be attached to the stems for improved preservation. The TPDP asked the DP drafting group to clarify this and adjust the text as necessary. Regarding the time period for the sampling, the TPDP agreed that mention of "spring" and "autumn" should be avoided as this does not apply to all regions, e.g. tropics.

[102] The TPDP discussed the sample size at length. It was noted that annexes to ISPM 27 (*Diagnostic protocols for regulated pests*) does not give specific guidance on sampling, but indicates the amount of samples required to perform the diagnostic tests. The TPDP pointed out that each test had a different specificity and sensitivity and that this would impact the sample size to be tested. Thus, the TPDP agreed to add the weight of the sample rather the number of leaves or petioles. The TPDP noted that DP 4 for *Tilletia indica* Mitra[18] contains guidance on sampling but pointed out that it relates to the level of confidence and that this reference in DP 4 is concerning seed sampling.

[103] One TPDP member queried the reference to ISPM 31 (*Methodologies for sampling of consignments*). The TPDP agreed that the reference could be deleted as ISPM 31 concerns sampling in a consignment, which was outside of the scope of this draft.

[104] Sampling of vectors. Another TPDP member queried the best way to store the insect vector in order to perform the bacteria diagnosis at a later time, for instance if normal entomology practices would suffice (e.g. preservation in ethanol or freezing). It was explained that these should suffice but that it should be verified if the quality of the bacteria DNA would be affected by long periods of being stored in ethanol.

[105] Serological detection. One TPDP member suggested adding the immunofluorescence test, as some countries use it but it had not been mentioned in the draft diagnostic protocol. The TPDP agreed to mention this test as an option and asked the DP drafting group to provide references in a background paragraph for serological tests.

[106] Serological detection - Preparation of material. The TPDP requested additional information on the actual preparation of material, for example if leaves should be macerated.

[107] ELISA. The TPDP pointed out that there was a need to clarify the controls used and the interpretation of results. The panel agreed that the section should be reorganized in accordance with the *Instruction to Authors*.

[18] DP 04: *Tilletia Indica* Mitra: https://www.ippc.int/en/publications/2457/

[108] Conventional PCR. The TPDP agreed that information on the PCR mix was not sufficient and that further information was needed on the components and final concentrations. The TPDP also noted too many brand names were mentioned and that this should be avoided when possible.

[109] The TPDP found that information on primer pairs lacked explanations on when to use the individual ones or if they should be used in combination. The TPDP agreed that guidance on this and PCR multiplex should be given. The tables with the PCR conditions should be adjusted according to the *Instructions to authors*.

[110] Real-time PCR. Some TPDP members queried whether the information on diagnostic specificity and sensitivity needed to be 100%. If it was the case, they suggested that additional references be provided to support this because, normally, it depends on the host plant. Some TPDP members queried about the brand names for real-time PCR, because validation data was needed. The TPDP agreed that the mentions of brand names should be adjusted or removed.

[111] Regarding Cut off (Ct) values, such as threshold cycles, the TPDP agreed that more information was needed especially on the interpretation of results and on how to verify the Ct values. The TPDP noted that some of the primers for the Ct values provided were contradictory and should be verified.

[112] The TPDP also agreed that the tables should be adjusted according the *Instructions to Authors*, and that primer names should be given.

[113] LAMP. It was noted that this test was described referring to both a paper and to a commercial kit. The TPDP recommended separating the information and to highlight the differences between them. For observation of the color result, the TPDP felt that it should be clarified if this test would require a dye.

[114] Controls for molecular testing. The TPDP agreed that the minimum requirements for controls should be clarified as there were several types of controls described.

[115] Identification. One TPDP member queried if there was a need to isolate the bacteria and then confirm its identity, especially in cases of latent infection or asymptomatic plants. It was clarified that this bacteria is difficult to isolate (i.e. fastidious) so instead a molecular result would suffice. However, for critical outcomes (e.g. post-entry quarantine samples, new host record, new country record) it was recommended that the extra effort should be made to isolate the bacteria and fulfill Koch's postulates. The TPDP agreed to adjust the text accordingly.

[116] Culture media – Colony morphology. The TPDP noted that this was not a minimum requirement and that this point should be highlighted in the draft DP. The information should, however, be kept for situations of critical outcomes as it was recommended to isolate and fulfill Koch's postulates in those circumstances (see also above).

[117] Description and biochemical characteristics. One TPDP member queried if other *X. fastidiosa* strains from another laboratory could be provided as reference material, and the TPDP asked the DP drafting group to check this.

[118] Pathogenicity tests. One TPDP member queried which host species was required to perform pathogenicity tests, because the list of possible host species provided contained some non-symptomatic hosts. The TPDP asked the DP drafting group to provide clarification on the host species and on the purpose of performing the pathogenicity test (e.g. if needed for confirmation of a new host).

[119] Molecular identification. The TPDP agreed that information on how to perform sequence analysis and on the interpretation of the results was needed.

[120] Multi-locus sequence analysis. The TPDP agreed that this section should include general information on how to perform identification of sub-species as the scope of this draft was for the species *X. fastidiosa*.

[121] Contact-points. The TPDP agreed that, after the expert consultation stage, some other key researchers should be added to the list.

[122] Flow diagram. The TPDP suggested adding a flow diagram as it would help clarify the minimum requirements.

[123] The TPDP:

(5) *invited* the discipline lead and the referee to consider the TPDP recommendations, adjust the draft diagnostic protocol for *Xylella fastidiosa* (2004-024) and forward it to the DP drafting group for their revision. Following this, the draft DP will be submitted to the expert consultation period. Hereafter, the draft diagnostic protocol will be revised by the DP drafting group and presented to the TPDP via e-decision for recommendation to the SC for approval for consultation.

4. Updates from relevant IPPC bodies

4.1 Updates from other relevant IPPC meetings

[124] The Secretariat gave a brief update on relevant TPDP issues from the Eleventh Session of the Commission on Phytosanitary Measures (CPM-11, 2016)[19], mentioning the following points:

- CPM adopted the recommendation on the importance of pest diagnosis (Appendix 16 of the CPM-11 report) and encouraged advocacy for enhanced attention by contracting parties to the issue of pest diagnosis. CPM also encouraged continued liaison with RPPOs and research and educational organizations on pest diagnosis issues, and encouraged the IPPC Secretariat to publicize national, regional and international developments in pest diagnosis and DPs on the phytosanitary resources page.
- CPM adopted an adjusted the Standard setting procedure with the first consultation period now lasting 90 days. For 2017 there will be only one consultation (starting July) for draft diagnostic protocols, along with other draft ISPMs.

[125] Some TPDP members expressed concerns about having only one consultation for draft diagnostic protocols. They feared the momentum with authors might be lost and that new techniques that may be developed might not be included in the diagnostic protocol due to the lengthy approval process (as some drafts would need to be postponed for consultation at a later point), but the Secretariat indicated that this was due to limited resources.

[126] The TPDP Steward, Ms Jane CHARD (United Kingdom), provided an update on the relevant TPDP issues arising from the SC May 2016 meeting[20], extending the SC's profound thanks to the TPDP and to the authors of the DP drafting groups for the important work they do. She mentioned that the SC approved the technical revision, as proposed by the TPDP, to the adopted DP 7 on *Potato spindle tuber viroid*, which has been made posted on the IPP. It was pointed out that the SC had added the diagnostic protocol for Genus *Ceratitis* (2016-001) with priority 1 to the TPDP work programme.

[127] Regarding the draft diagnostic protocol for Genus *Ceratitis* (2016-001), the current DP drafting group would be composed of the same authors as for the draft diagnostic protocol for Tephritidae: Identification of immature stages of fruit flies of economic importance by molecular techniques (2006-028). The lead agreed to try to contact to engage the authors for the development of this new draft. It was noted that there

[19] The final report of the CPM-11 is available at: https://www.ippc.int/en/core-activities/governance/cpm/

[20] 2016 May SC meeting report: https://www.ippc.int/en/publications/82530/

is a need for authors with morphological experience, and consequently the TPDP asked the Secretariat to open a call for additional authors.

[128] The Secretariat informed the TPDP that the presentation and the update on the TPDP work, made at the SC May 2016 meeting, were posted on the IPP TPDP webpage[21].

[129] The TPDP:

(6) *noted* the update from the CPM-11 (2016) meeting

(7) *noted* the update from the SC May 2016 meeting

(8) *requested* the Secretariat to consider opening a call for authors for the draft DP for Genus *Ceratitis* (2016-001), with focus on morphological expertise, noting that more than one author may be selected.

5. Overview of the TPDP work programme

5.1 General overview of diagnostic protocols and next steps

[130] The Secretariat presented the 2016-2017 standard setting calendar related to DPs and the current status of the TPDP work programme (see figures 1 and 2), including the dates when the 22 DPs on the TPDP work programme, would tentatively reach the various steps in the standard setting process (i.e. expert consultation, consultation period, submission to the SC for approval for adoption and DP notification period[22]). The Secretariat highlighted the continued unprecedented workload for processing DPs, noting that the dedicated involvement of all TPDP members and DP drafting groups (with over 100 experts involved). She noted that there were currently six draft DPs presented in the DP notification period[23] (July 2016) and that three DPs had already been adopted after the close of another DP notification period (ending in February 2016).

[131] The Secretariat stressed the need for the discipline leads to continue engaging experts in the DP drafting groups in order to meet the established deadlines in order to have these DPsadopted. It was highlighted that deadlines may be negotiated between TPDP members and the DP drafting groups, as long as it is clear that if deadlines are not met, the adoption of the DPs may be delayed.

[132] The Secretariat recalled that in 2014 a SWOT analysis (Strengths, Weaknesses Opportunities, Threats)[24] was performed on the TPDP work. During the analysis, the panel had identified the potential "threats" that may arise. It was concluded that there is a strong need to continue the work on draft DPs through to the adoption stage (see also agenda item 7.7. "Challenges and the importance of the TPDP work").

[133] Some TPDP members pointed out that the importance of DPs and the need for the work of the TPDP to obtain more visibility. They stressed that DPs are crucial for surveillance, pest status, support eradication programs, the application of proper phytosanitary treatments and export certification. The TPDP felt that if contracting parties agree that pest diagnosis is a key issue, they should be stating this in IPPC strategic meetings to help promote visibility on the importance of DPs. TPDP members were encouraged to communicate this at their regional and national levels.

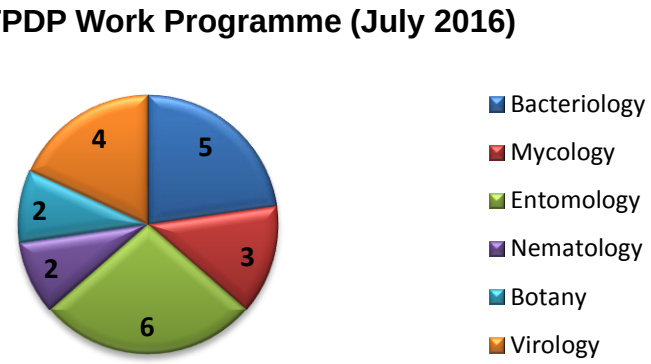
[21] TPDP public page: https://www.ippc.int/en/core-activities/standards-setting/expert-drafting-groups/technical-panels/technical-panel-diagnostic-protocols/

[22] Presentation available at the restricted TPDP work area: https://www.ippc.int/en/work-area-pages/technical-panel-on-diagnostic-protocols-tpdp/2016-july-montego-bay/

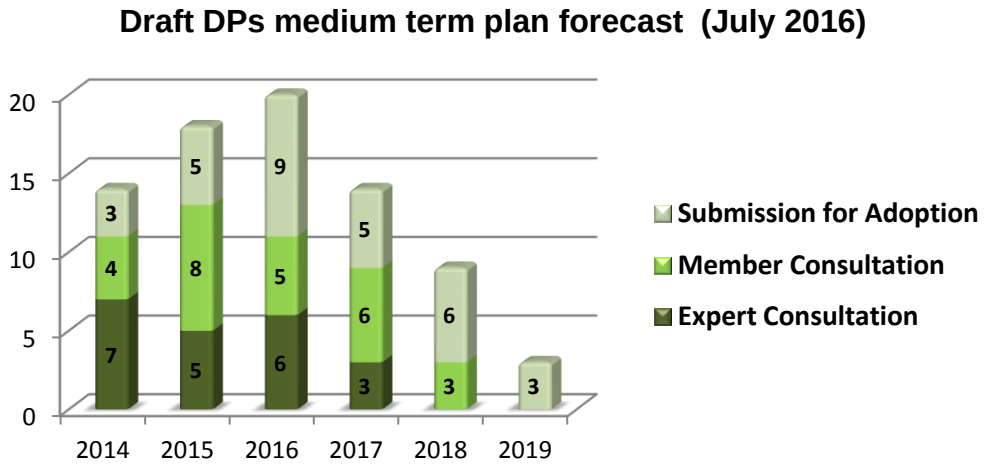
[23] DP Notification period: https://www.ippc.int/en/core-activities/standards-setting/draft-ispms/notification-period-dps/

[24] 2014-07 TPDP Meeting Report: https://www.ippc.int/en/publications/2579/

[134] **Figure 1.** Number of subjects (DPs) per topic (discipline) under the Technical Panel on Diagnostic Protocols (TPDP) work programme (updated on 2016-07-08).



[135] **Figure 2.** Draft diagnostic protocols (DPs) medium term plan forecast: Number of DPs under the Technical Panel on Diagnostic Protocols (TPDP) work programme per year (forecast) under different stages of the Standard setting process (updated on 2016-07-08).



5.2 General overview of status of protocols

Reports on individual DPs status by discipline leads (scope and status of protocols)

[136] The Secretariat introduced the *List of topics for IPPC standards*[25] and the document that outlines the status of all the draft DPs[26]. Each discipline lead provided updates on development of each individual draft. Discipline leads and referees were modified for some draft DPs and updated information will be reflected in the *List of Topics for IPPC Standards*.

[137] The main points raised on individual draft DPs were as follow:

[138] ***Sorghum halepense* (2006-027).** The DP drafting group reviewed the comments from the consultation and revised the draft diagnostic protocol. The Secretariat informed the panel that a TPDP e-decision will

[25] List of topics for IPPC standards: https://www.ippc.int/en/core-activities/standards-setting/list-topics-ippc-standards/

[26] 14_TPDP_2016_Jul

open soon and the aim is to submit this draft DP to the SC for approval for the next DP notification period (15 December 2016 – 30 January 2017).

[139] ***Dendroctonus ponderosae* (2006-019).** The DP drafting group was working on responding to the comments from the consultation and the aim is to submit this draft diagnostic protocol to the SC for approval for the next DP notification period (15 December 2016 – 30 January 2017).

[140] ***Anguina spp.* (2013-003).** The DP drafting group is working on responding to the comments from the consultation and the aim is to submit this draft diagnostic protocol to the SC for approval for the next DP notification period (15 December 2016 – 30 January 2017).

[141] ***Candidatus* Liberibacter solanacearum (2013-001).** This draft diagnostic protocol is currently under consultation. The discipline lead confirmed that it would be possible to work on the comments from the consultation with the aim to submit this draft to the SC for approval for the next DP notification period (15 December 2016 – 30 January 2017).

[142] ***Phytophthora ramorum* (2004-013).** This draft diagnostic protocol is currently under consultation. The discipline lead confirmed that it would be possible to work on the comments from the consultation with the aim to submit this draft to the SC for approval for the next DP notification period (15 December 2016 – 30 January 2017).

[143] ***Fusarium circinatum* (2006-021).** This draft diagnostic protocol is currently under consultation period. The discipline lead confirmed that it would be possible to work on the comments from the consultation with the aim to submit this draft to the SC for approval for the next diagnostic protocol notification period (15 December 2016 – 30 January 2017).

[144] ***Striga* spp. (2008-009).** The DP drafting group is working on the development of the draft and the aim is to submit to the expert consultation in October 2016 to be discussed by the TPDP at its next face-to-face meeting.

[145] ***Bactrocera dorsalis* complex (2006-026).** The DP drafting group was finalizing the drafting of this DP following the information on synonymization of *Bactrocera* species. A first version of the draft was expected to be submitted to the expert consultation in October 2016 with the aim of discussing it at the 2017 TPDP face-to-face meeting.

[146] ***Ips* spp. (2006-020).** A first version of the draft was expected to be submitted to expert consultation in October 2016 with the aim of discussing it at the 2017 TPDP face-to-face meeting.

[147] ***Conotrachelus nenuphar* (2013-002).** The draft diagnostic protocol was under development and a first version was expected to be ready end October 2016 to be submitted to expert consultation with the aim to discussing it at the 2017 TPDP face-to-face meeting.

[148] **Genus *Ceratitis* (2016-001).** It was recalled that the TPDP entomologists members would try to contact the authors for this new draft but that there was a need for authors with morphological experience. Consequently, the panel requested the Secretariat to open a call for authors (see section 4.1 of this report). The TPDP agreed to assign Ms Geraldine ANTHOINE (France) as the new referee for this draft diagnostic protocol. The TPDP was informed that, if new authors with morphological expertise were selected in 2016, this draft would be submitted to the expert consultation in the first quarter of 2017.

Review of DP drafting groups associated with the work programme

[149] The TPDP reviewed the progress of the DP drafting groups and it was noted that some authors had not been in contact with the discipline leads. Discipline leads were requested to try to establish contact with

these authors by August 2016. If any difficulties were encountered, the discipline leads should request assistance from the Secretariat.

[150] The TPDP noted the DP drafting groups' composition and contact information are pposted on the TPDP page of the IPP[27] and were encouraged to help ensure this information is up to date for their respective DP drafting groups.

6. Procedures and guidance related to TPDP

TPDP Working procedures[28]

[151] There were no comments.

TPDP Instructions to Authors (Checklist for authors, Criteria for prioritization of protocols and Draft standardized template for draft diagnostic protocols)

[152] The TPDP *Instructions to Authors*[29] was reviewed. The Secretariat highlighted that the majority of the text in the *Instruction to Authors* is replicated in the *IPPC Style Guide*[30] and asked that the discipline leads to ensure the IPPC Style Guide was also shared with DP drafting groups.

[153] Changes noted throughout this report will be incorporated into the *Instructions to Authors* and the SC would be invited to note a summary of the changes.

Checklist for discipline leads and referees[31]

[154] There were no comments.

7. Follow-up on actions from the TPDP previous meetings

7.1 Best practices for sequencing

[155] The TPDP member, Mr Norman BARR, introduced a paper[32] on this topic. He recalled that this paper was developed with the intent to be an internal TPDP document on best practices for sequencing and to help guide the TPDP on the development of standards where sequencing is part of the minimum requirements of a diagnostic protocol.

[156] One TPDP member noted that it was a very good document as it articulated the requirements for barcoding. It was suggested that information on bidirectional sequencing was useful and the TPDP invited the discipline lead to develop specific guidance on bidirectional sequencing for possible inclusion into the *Instructions to Authors*.

[157] It was noted that this paper clearly stated that databases used by diagnosticians should be well-recognized as they are fundamental in supporting the validity of the diagnosis. It was also mentioned that the European and Mediterranean Plant Protection Organization (EPPO) was currently working on a database of sequence comparisons and could be used for the development of additional guidance. It was noted that, for DNA sequencing and comparison of sequences, there are several "non-qualified" sequences because sequences may be inserted into databases as soon as a scientific paper is released, but usually without cross-checking.

[27] IPPC Diagnostic Protocols (DPs) drafting groups: https://www.ippc.int/en/publications/2582/

[28] TPDP Working procedures: https://www.ippc.int/en/publications/1187/

[29] TPDP Instructions to Authors: https://www.ippc.int/en/publications/1180/

[30] IPPC Style Guide: https://www.ippc.int/en/publications/132/

[31] Checklist for TPDP discipline leads and referees: https://www.ippc.int/en/publications/81302/

[32] 07_TPDP_2016_Jul

[158] One member queried the use of a single reference sequence, because some DPs state that there should be more than one sequence; however in others only one is required. It was pointed out that the authors would have to determine the amount of variability with the sequence accession. It was explained that single references can be used to perform comparisons, and that this was reflected in the document. For example, in viruses, a type species is given and for insects, a voucher specimens should always be provided when possible.

[159] Another member queried the need to state the level of dissimilarity due to intraspecific variations. It was explained that when this information would be available, it should be included in the diagnostic protocol (as is the case for DP 10: *Bursaphelenchus xylophilus*).

[160] The TPDP:

(9) *encouraged* TPDP members to submit comments on the document to the lead (Mr Norman BARR) by 15 September 2016.

(10) *asked* Mr Norman BARR to prepare a revised version of the document based on the TPDP members' comments be discussed in a virtual meeting for possible inclusion in the *Instruction to Authors*.

(11) *agreed* that the document be posted as a working paper on the TPDP restricted work area page on the IPP and removed once the text from the revised version is included in the *Instructions to Authors*.

7.2 Negative extraction control

[161] The TPDP member, Ms Geraldine ANTHOINE, introduced a paper[33] on this issue. She noted that during the development of the DP 12 on Phytoplasmas an issue arose regarding the nature and status of negative extraction control for PCR. During the TPDP September 2015 virtual meeting, the TPDP discussed the objection received to DP 12 on this issue. The objection highlighted that a negative extraction control was required when large number of positive samples are expected.

[162] The TPDP considered the minimum requirements for a negative extraction control for PCR. The main points of discussion were as follows:

[163] - A negative control is needed for monitoring contamination during nucleic acid extraction, or to monitor cross reaction. Negative extraction control should also be used when no internal control is available.

[164] - Not all adopted DPs have a negative extraction control, and this should be harmonized, taking into consideration that it is a common practice for diagnosis of viruses and bacteria but not for other pests (e.g. many insects and nematodes).

[165] - It may not be appropriate making a negative extraction control a requirement because in most cases, even in outbreak situations, there will be a large number of negative samples and these would therefore be acting as a negative extraction control. In these situations, an internal control is more important because it is able to determine whether the test had truly functioned.

[166] - If the negative buffer control could act as a control. It was explained that it can indicate any cross-contamination, but the buffer used must be the same buffer solution used to perform the sample analysis. Therefore, sometimes it is better to use a negative buffer control to avoid the risk of interference from the host tissue and because it may be difficult to obtain healthy host tissue.

[33] 10_TPDP_2016_Jul

[167] The TPDP supported that for each test a set of controls should be used, but agreed that the set would vary from test to test and from pest to pest. Thus, it would be up to the individual DP drafting group to decide when defining the minimum requirements of which tests should be performed for diagnosis. Thus, the minimum requirements for control would be, for example, negative extraction control, internal controls and negative amplification control (no template control).

[168] The TPDP asked the lead to prepare a document with control options for each pest group (i.e. for each discipline) and present it to the TPDP in a virtual meeting. In the meantime, it was agreed to modify the *Instructions to Authors* to reflect the conclusions reached above.

[169] The TPDP:

(12) *asked* Ms Geraldine ANTHOINE to prepare a document with control options for each pest group (i.e. each discipline) and present it in a virtual meeting

(13) *asked* the Secretariat to adjust the *Instructions to Authors* to stress that the control options to be included in a draft diagnostic protocol should be decided by the individual DP drafting group.

7.3 "Methods", "tests" and "assays"

[170] The TPDP member, Ms Geraldine ANTHOINE, introduced a paper[34] on this issue. She noted that "*test"* is defined in ISPM 5 as:

> "Official examination, other than visual, to determine if pests are present or to identify pests"

[171] She highlighted that ISPM 27 mainly refers to "methods" as being official. For instance, under the scope section in ISPM 27, it states that:

> "This standard provides guidance on the structure and content of the International Plant Protection Convention (IPPC) diagnostic protocols for regulated pests. The protocols describe procedures and methods for the official diagnosis of regulated pests that are relevant for international trade. They provide at least the minimum requirements for reliable diagnosis of regulated pests."

[172] This would mean that it would be expected to find "methods" in the protocols (rather than "assay" and "test"). Also, the DP 7 for Potato spindle tuber viroid largely used the term "method" to describe the procedure for detecting the viroid.

[173] It was noted that in recently adopted DPs, the word "assay" was not used, also because it is difficult to translate into other languages. One TPDP member felt that the TPDP should only review the use of the terms in the drafts under development.

[174] It was pointed out that according to the Oxford dictionary definition[35], "method" is more general and procedural. The TPDP agreed that "method" covers procedures in the broad sense, such as molecular methods, serological methods (with common principles) and that "test" refers to a technique, matrix (host) and pest.

[175] The TPDP *agreed* that the concept of "test", in accordance with the Glossary definition (ISPM 5), should not be used when performing visual examination but can be used for morphometric tests, for example LAMP. "Test" would be a specific testing. However, to avoid using the term "test" too often for PCRs would not be followed by the word "test" but the following phrase used instead, for example "PCR described by Lin *et al*., 2010".

[34] 06_TPDP_2016_Jul

[35] Oxford dictionary definition for "method": http://www.oxforddictionaries.com/definition/english/method

[176] The TPDP agreed that "method" covers the technique applied on a specific matrix (e.g. tomato plants, tomato seeds, seeds). "Methods" therefore include: bioassay methods, biochemical methods, fingerprint methods, isolation/extraction methods, molecular methods, morphological and morphometrical methods, pathogenicity assessment, and serological methods. And each "method" includes different tests (e.g. PCR or sequencing for molecular methods).

[177] Lastly, the TPDP agreed to avoid the using the word "assay", because it may be interpreted differently in various languages and may lead to confusion.

[178] The TPDP:

(14) *asked* the Secretariat to update the IPPC Style guide with the guidance provided on "assay", "method" and "test".

7.4 Quality Assurance issues

[179] The TPDP member, Mr Norman BARR, introduced a paper[36] on this issue. He noted that the panel had reviewed earlier versions of this document. He pointed out that the TPDP agreed that the document should serve as an internal resource for discipline leads and that it compiled terminology related to quality assurance in DPs. He also mentioned that the objectives of this document were to encourage consistency in usage on terms related to quality assurance and to inform discipline leads on terms not common to all disciplines but useful when reviewing DPs.

[180] There was a discussion on whether it should be mandatory to indicate in the draft diagnostic protocol when no data on specific validation aspects (e.g. sensitivity) were available in order to clearly indicate that this element had not simply been omitted. It was noted that in ISPM 27 it says that the level of sensitivity, specificity and reproducibility of each method should be indicated whereas possible.

[181] The TPDP:

(15) *agreed* that the document be posted on the TPDP restricted work area page on the IPP for future references, as needed, by the TPDP members;

(16) *encouraged* TPDP members to submit comments to this document to the lead (Mr Norman BARR) by 15 September 2016;

(17) *agreed* to modify the *Instruction to Authors* to make it mandatory to provide information on any element of the validation data if not available (e.g. sensitivity).

7.5 Next generation sequencing

[182] The TPDP member, Mr Brendan RODONI, introduced a paper[37] on this issue. He explained that next generation sequencing (NGS), also known as whole genome sequencing (WGS), enables a new and comprehensive strategy to detect and characterize, at the sequence level, RNA and DNA molecules in a biological sample. Application of this technology has resulted in the discovery of previously undetected microorganisms. Research findings from NGS studies are shedding new light on the role of some microorganisms within an ecosystem; and plant viruses are being considered not only as pathogens, but also as mutualists that provide a benefit to the host plant or simply as commensal agents.

[183] He highlighted that these findings have significant implications within a plant protection framework given that quarantine measures are based on the presence of a "pest" rather than the presence of "symptoms". He also mentioned that there is a risk that plant material may be restricted in international movement due to the perceived presence of a microorganism (e.g. virus) that may not have the potential to be pathogenic to its host. He noted that there is also the question of the detection of non-viable organisms (see section

[36] 13_TPDP_2016_Jul

[37] 15_TPDP_2016_Jul

7.6 of this report). He queried the usefulness and practicability of NGS in pest diagnosis within the IPPC scope as it is a new powerful tool, which is useful for research and because diagnostic laboratories are likely to be embracing this new technique.

[184] The TPDP noted that NGS still have some limitations as may also lead to false negatives and false positives. One member mentioned that the ICTV in their 2016 meeting had included NGS in their agenda and that possible guidelines would be developed soon. One TPDP member noted that NGS is a method that can be used not only for viruses but for other pests as well. Thus, the question arises on what can be considered as a "pest". One TPDP member noted that currently the minimum requirements for IPPC DPs do not include NGS, and usually they consider more than one test.

[185] It was also highlighted that NGS will generate a huge amount of data, but for NPPOs a strong characterization of these data would be needed. One TPDP member mentioned that in some countries, when a new host is imported a quick characterization is performed to analyze more efficiently the potential risks from new organisms. This information could be used by pest risk analysts.

[186] The TPDP stressed that NGS provides useful information for new discoveries, but caution would be needed before incorporating this into DPs or regulations.

[187] The TPDP noted that, if NGS is included in a diagnostic protocol, it should be limited to the target pest and give all the guidance for its diagnosis, for example appropriate controls, appropriate reference material, sequence for the target pest.

[188] The TPDP also mentioned that more information from the regulatory perspective e would be beneficial to understand better the constraints that this technique may have. It was pointed out that since NGS can detect a large range of microorganisms, it would be essential to define if the organism detected was of phytosanitary concern. It was recalled that on the issue of associating a pest to a disease after the finding of a sequence of an unknown microorganism, it is necessary to go back to the principles of plant pathology: fulfill Koch's postulates. The TPDP felt this was a sensitive issue as it could lead to possible trade disputes. In this connection, it was noted that it was important to clarify in which situations NGS may have implications for trade and whether to include NGS in DPs.

[189] In conclusion, the TPDP pointed out that although several questions still needed to be answered on this technique and in spite of its high cost, it is likely that laboratories will be using it more in the future. Therefore, the implementation and regulatory issues should be considered and awareness raised.

[190] The TPDP suggested to invite the SC to consider this discussion and the points raised to create awareness about this new technique and the possible impacts for regulations.

[191] The TPDP:

(18) *noted* the importance of the Next generation sequencing technique and some possible impacts on pest diagnosis.

(19) *asked* Mr Brendan RODONI to revise the document for the next TPDP face-to-face meeting with additional focus on possible guidelines to be included in IPPC DPs.

(20) *asked* Mr Brendan RODONI and Ms Françoise PETTER to contact the ICTV to follow-up on the outcomes of their discussions on this matter and share this information with the TPDP through the Secretariat.

(21) *invited* the SC to consider the discussions on the potential implications of the use of next generation sequencing as a diagnostic technique.

7.6 Diagnostic protocols and viability of pests

[192] The TPDP member, Ms Geraldine ANTHOINE, introduced a paper[38] on the issue. She mentioned that there is a tendency to include molecular methods targeting DNA in DPs. However, DNA molecules may be detected as single molecules in a product or extracted from a living organism.

[193] It was noted that ISPM 27 states in its scope that "the protocols describe procedures and methods for the official diagnosis of regulated pests that are relevant for international trade". However, other IPPC standards (e.g. ISPM 15 on *Regulation of wood packaging material in international trade* and ISPM 28 on *Phytosanitary treatments for regulated pests*) describe procedures for the treatment of specific commodities to kill the pests present in or on them. This means that DNA molecules may still be detectable using molecular methods (e.g. real-time PCR) after a phytosanitary treatment.

[194] One TPDP member noted that while this was an important issue it would be very difficult to include minimum requirements on viability of pests. The TPDP, however, stressed that DPs should still provide clear guidance on additional tests (and methods) that may be needed in case of positive results with DNA tests.

[195] Another TPDP member mentioned that DPs are intended to be performed by diagnosticians and any molecular tests may detect viable and non-viable pests. The TPDP queried if there was a need to have a viability test section in DPs, because it was not really part of a diagnostic protocol. One TPDP member suggested modifying the *Instruction to Authors* to address this with a general explanation (i.e. in the case of confirmed viability, further tests should be performed). Some TPDP members expressed concerns on this proposal, as it could instruct NPPOs how to interpret the results, which could lead to confusion and possible trade barriers. It was pointed out that for specific pests where viability is a crucial issue, the diagnostic protocol could indicate this if tests were available.

[196] One TPDP member felt that the detection of non-viable pests was an implementation issue related to the NPPO's interpretation of the results. However, the TPDP recalled that ISPM 27 mentions this issue, as does the *Instruction to Authors*.

[197] One TPDP member suggested that the world would benefit from a document with a literature review on molecular tests and viability of pests, and hoped that some group in the near future could undertake this work.

[198] The TPDP:

(22) *noted* that indirect tests (molecular tests) may detect viable and non-viable organisms;

(23) *noted* that it would be useful to have a literature review on existing methods to detect viable and non-viable pests.

(24) *acknowledged* that methods to detect viable and non-viable pests was a broader discussion beyond the TPDP's mandate

(25) *invited* the SC to consider the TPDP discussions on DPs and viability of pests.

7.7 Challenges and the importance of the TPDP work

[199] The Steward, Ms Jane CHARD (UK), introduced a paper[39] on this issue. She highlighted that the TPDP members have been working extremely hard over the last few years, managing more than 100 authors of protocols to complete the production of the DPs under the work programme. She recalled that a first

[38] 11_TPDP_2016_Jul

[39] 05_TPDP_2016_Jul

discussion on this topic was done in the 2015 TPDP face-to-face meeting, and that, in the November 2015 virtual meeting[40], the TPDP agreed to discuss the future goals of its five year plan further.

[200] She recalled that the TPDP had agreed that a priority for the TPDP would be to review adopted DPs, as this is task 5 in the TPDP Specification[41]. The TPDP stressed that there was also a need to update publications (literature references) and modernize the DPs with the latest technology applicable as it is imperative that DPs do not become outdated. She also pointed out that the TPDP had noted that the very few IPPC Secretariat's human resources available to coordinate the TPDP's work was under severe pressure to deal with the high volume of DPs being processed and this was unlikely to change in the near future.

[201] The Steward recalled the Implementation Review and Support System (IRSS) survey[42] on the implementation of ISPM 17 (*Pest reporting*) and ISPM 19 (*Guidelines on lists of regulated pests*) which was conducted in 2014 and where countries were asked to list the five pests of most concern. On that same year, the TPDP discussed the IRSS survey results when developing the TPDP's SWOT analysis[43].

[202] The document presented at this meeting ("Challenges and the importance of the TPDP work") focused on three issues and possible objectives to be carried out by the TPDP:

a) Review and update of existing DPs (see section 7.8 of this report);

b) Develop new DPs, based on the needs of contracting parties; and

c) Requirements for specific aspects of pest diagnosis.

[203] The TPDP made the following observations and comments:

- The TPDP should focus its work on what the IPPC community and the CPM establish as priorities, and surveillance was currently a high priority.
- There is likely a need to develop new DPs and some regions (e.g. Caribbean) are developing priority pest lists to be able to propose new DPs for the TPDP work programme. It was noted that although there may be regional DPs available, internationally harmonized DPs have major importance as they could be used globally to settle non-compliance.
- Although the TPDP may be supportive of efforts to develop guidance documents, e.g. linked to implementation of DPs, this work should be mandated by the SC. In this context, one TPDP member 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 considered when it would be appropriate to recommend to the SC that the questionnaire be sent to contracting parties and 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.

[204] As to the development of new DPs, based on the needs of contracting parties, the TPDP identified three opportunities, as outlined below.

[205] a) To address gaps and capacity issues: There are a number of pests that are not covered by any protocols and some contracting parties or regions do not have the capacity to develop relevant DPs. The TPDP felt that there was a clear need to ensure that DPs identified as essential in specific countries or regions are

[40] 2015-11 TPDP Virtual Meeting Report: https://www.ippc.int/en/publications/81861/

[41] Specification TP 1 - Technical Panel on Diagnostic Protocols: https://www.ippc.int/en/publications/1297/

[42] IRSS survey report (ISPM 17 and ISPM 19): https://www.ippc.int/largefiles/2014/Survey-Analysis-NPPOs-17-19.pdf

[43] 2014-7 TPDP Meeting Report: https://www.ippc.int/en/publications/2579/

developed. The TPDP, however, noted that in some cases the lack of DPs for specific pests could be due a lack of science to support their development.

[206] b) New and emerging pests that are spreading in regions or globally: There will be a need to have appropriate protocols for new and emerging pests that are of global importance.

[207] c) Harmonize protocols to have global agreed position: The benefit of internationally harmonized DPs is that they are scrutinized globally, providing broader application and evaluating the available science globally, whereas regional protocols address issues from a regional perspective. In this context, it was suggested that the TPDP may use their expertise to develop international guidance material for NPPOs on the interpretation of diagnostic tests (e.g. detection of viable x non-viable organisms and NGS). The TPDP noted that the mandate of the TPDP was to oversee the development of the DPs but that it was important that guidance material would be produced to help NPPOs. The TPDP felt that the SC should be made aware of the issue to raise awareness within the IPPC community.

[208] The TPDP brainstormed on identifying current gaps for DPs using the *List of Topics for IPPC Standards*, pests identified by the IRSS surveys, pests that currently have no regional DPsdeveloped and emerging pests with global concerns. Consequently, the TPDP formed the following list of pests identified with the immediate need for development of internationally harmonized DPs.

- *Agrillus plannipennis* (“Emerald Ash Borer”)and *A. anxious* (“bronze birch borer”)
- *Citrus leprosis virus* (“citrus leprosis”)
- *Magnaporthe oryzae* on *Triticum* spp. (“wheat blast”)
- *Microcyclus ulei* (“South American leaf blight”)
- *Moniliophthora roreri* (“frosty pod rot of cocoa”)
- *Mononychellus tanajoa* (“cassava green mite”)
- *Puccinia graminis* f. sp. *tritici* UG 99 (“wheat stem rust”)
- *Thecaphora solani* (“potato smut”)

[209] The TPDP assigned leads for the identified pests and agreed to develop one page summaries of the pests and the justification for a need to develop DPs. These documents would be discussed in a virtual meeting and the conclusions shared with the SC. This to raise awareness on the need to develop new DPs and possibly leading to the pests’ possible inclusion in the TPDP work programme.

[210] The Secretariat reminded the TPDP that under the 2016 adopted Standard Setting Procedure, only contracting parties and RPPOs could now submit topics for new standards or for revisions. Even though DPs are subjects and are under the SC remit, the Secretariat encouraged TPDP members to work with their NPPOs or RPPOs to submit potential revisions or new topics for DPs in response to the IPPC Secretariat’s biennial call for topics.

[211] The TPDP:

(26) *agreed* to discuss justifications for the possible development of new topics for DPs in a future meeting.

7.8 TPDP work: review adopted DPs for the need to update

[212] The Secretariat introduced a paper[44] on this issue, outlining that the revision of adopted DPs is a task in the TPDP specification but the submission of the DP for revision still needs to be made by an NPPO or an RPPO.

[213] The first adopted protocol, DP 1 for *Thrips palmi* Karny was adopted in 2010 and according to ISPM 27, the TPDP members should review the DPs in their discipline every 5 years or as determined by the TPDP. The entomologist TPDP members will analyze further the need for a revision. It was agreed that they would prepare a summary for a TPDP virtual meeting.

[214] Regarding the DP 2 for *Plum pox virus* (PPV), adopted in 2012, the virologist TPDP member and lead at the time of the drafting, noted that there were new strains of the virus that were not covered in the DP. He also pointed out that the DP would probably need a major revision due to the possible inclusion of new tests for the diagnosis of these new strains (e.g. real-time PCR). The virology discipline lead, Mr Delano JAMES, would lead this revision for the next face-to-face meeting. It was noted, however, that the request for the revision of this subject would be submitted to the SC.

[215] The TPDP:

(27) *invited* the SC consider adding the Revision of DP 2 for *Plum pox virus*, with priority 1, to the List of topics for IPPC standards due to recent findings of news strains of the virus that are not covered in the adopted version of the DP.

(28) *asked* Mr Delano JAMES to prepare a summary with the main points for the need to perform a revision to DP 2 for *Plum pox virus* to be presented to the SC.

8. Liaison

European and Mediterranean Plant Protection Organization (EPPO) update on diagnostic protocols

[216] The invited expert, Ms Françoise PETTER (EPPO), made a presentation with an overview of EPPO's diagnostic protocol activities.

[217] She mentioned that 113 pest-specific protocols were approved by EPPO and that 11 horizontal standards were under development. Future plans for horizontal standards on the work programme included guidelines on flexible scopes for plant health, guidelines on a national reference laboratory, guidelines for NGS and guidelines on reference material (based on the Q-collect project outcomes). She also mentioned that there are nine EPPO standards under revision of which eight to align them more closely with IPPC DPs. She also noted that EPPO was undertaking a survey on the use of EPPO DPs among its members.

[218] She highlighted that there was a consortium with several countries related to NGS with an overall goal of development and adaptation of standardised NGS technologies for the detection and identification of viruses and viroids. She also provided an update on the EUPHRESCO project noting its continued support for the coordination and collaboration in the area of phytosanitary research.

[219] The TPDP:

(29) *noted* the update on EPPO activities on DPs.

International Organization for Standardization (ISO)

[220] Mr Delano JAMES provided an update on the project ISO/TC 34/SC 16 *Horizontal methods for molecular biomarker analysis,* and more specifically on the draft ISO standard *General requirements for*

[44] 17_TPDP_2016_Jul

molecular biology analysis for detection and identification of destructive organisms in plants and derived products, which overlaps with some of the work on IPPC DPs.

[221] He mentioned that there is no interference with IPPC DPs, as the ISO standard did not provide guidance on DPs, but on what laboratories should put in place to utilize DPs. Some TPDP members still expressed some concerns on the scope of this ISO standard, pointing out that it may interfere with how NPPOs use DPs. Some TPDP members noted that most of the working group members were not plant health specialists, but food health specialists, thus expressed concerns on the real need on this ISO standard. It was pointed out that there were still some issues that needed to be addressed on definitions in current draft text, for instance "controls" and "validation" as communicated by the IPPC Secretariat to the ISO working group convener. Some members queried if it was possible to share the draft ISO standard with the TPDP for their appreciation.

[222] The Secretariat noted that the CPM was informed about the development of this ISO standard and that CPM-11 (2016) had been informed by the Secretariat that interested stakeholders may wish to follow the development of this ISO standard and submit comments through their national ISO contact point.

[223] The TPDP:

(30) *noted* the update on the ISO project ISO/TC 34/SC 16 *Horizontal methods for molecular biomarker analysis*.

(31) *asked* Mr Delano JAMES to contact the convener to ask if it is possible to share the draft standard, once submitted for voting, with the TPDP for their appreciation.

Global Taxonomy Initiative (GTI)

[224] Mr Norman BARR informed the TPDP about the recent activities under the GTI. He mentioned that GTI is working on DNA barcoding, especially on the matter of validation and verification of data, and that the GTI is keen to work on building a stronger relationship with the TPDP. He highlighted that experts contributing to the GTI through the Expertise Centre for Taxonomic Identification (ETI) were invited to provide comments on the IPPC draft DPs during the expert consultation period to help building this synergy between the GTI and the IPPC DPs.

[225] The TPDP:

(32) *noted* the update on the GTI.

9. TPDP work plans

TPDP Work plan 2016-2017

[226] The TPDP reviewed their tentative work plan for 2016-17 and modified it according to decisions taken in this meeting (Appendix 4).

[227] For ease of reference, a list of action points arising from the meeting is attached as Appendix 5.

10. Date and Location of Next Meeting

[228] The next TPDP face-to-face meeting is tentatively scheduled for 13 – 17 February 2017 or 17 – 21 July 2017. No venue had been identified yet.

[229] The TPDP discussed the possibility of inviting Ms Françoise PETTER (EPPO) to participate in the meeting. The panel felt that it would be positive for Ms PETTER to participate because she had contributed with valuable input in previous TPDP meetings, was aware of the TPDP procedures and that her presence would help ensure synergies on an international level considering the large programme she manages. The panel also noted that participation from regional plant protection organizations as observers may prove beneficial.

[230] The TPDP:

(33) *invited* the SC to consider that Ms Françoise PETTER (EPPO) be invited to the 2017 TPDP face-to-face meeting, as invited expert.

11. Other Business

Draft DPs submitted to the DP Notification Period

[231] It was recalled that there were six draft DPs under the DP notification period which would close on 15 August 2016. It was mentioned that for some draft DPs, possible comments could arise on the consistency of the terminology and some outdated tests described, which may affect the performance of the diagnostic protocol.

[232] The TPDP briefly discussed some terminology issues and agreed that the wording "molecular test" should be used for all DPs instead of any other terminology (e.g. molecular amplification test) because it better reflected the full range of possibilities within molecular tests.

12. Recommendations to the SC

[233] Recommendations to the SC are described in previous sections of this report. For easier reference they are compiled below.

[234] The SC is invited to:

(1) *consider* the discussions on the potential implications of the use of next generation sequencing as a diagnostic technique.

(2) *consider* the TPDP discussions on DPs and viability of pests.

(3) *consider* including the subject Revision of DP 2 for *Plum pox virus*, with priority 1, into the TPDP work programme due to recent findings of news strains of the virus that are not covered in the adopted version of the DP.

(4) *consider* that Ms Françoise PETTER (EPPO) be invited to the 2017 TPDP face-to-face meeting, as invited expert.

13. Close of the meeting

Evaluation of the meeting

[235] The Secretariat informed the participants that an electronic evaluation form had been created and invited all TPDP meeting participants to submit their evaluation to improve the next set of TPDP meetings.

Close

[236] The IPPC Secretariat thanked the TPDP members for their hard work, commitment and motivation, recognizing not only the time allocated for the meeting and its preparation, but for all the intersessional work. The Secretariat asked TPDP members to extend its appreciation to all diagnostic protocol authors. The Secretariat also thanked the Ministry of Industry, Commerce, Agriculture and Fisheries of Jamaica and the Plant Quarantine/Produce Inspection division for hosting and co-organizing this meeting.

[237] The TPDP thanked the Chairperson for successfully managing the meeting and its discussions, the Rapporteur for ensuring the decisions made were correctly recorded, the Steward for her consistently valuable input and the Secretariat for their support.

[238] The Steward thanked the participants for their excellent work during the meeting and for their great efforts and commitment between sessions.

[239] On behalf of the TPDP, the Chairperson thanked the Ministry of Industry, Commerce, Agriculture and Fisheries of Jamaica and the Plant Quarantine/Produce Inspection division for hosting the meeting and for the hospitality provided. The Chairperson closed the meeting.

Appendix 01 - Agenda

2016 MEETING OF THE TECHNICAL PANEL ON DIAGNOSTIC PROTOCOLS

11-15 July 2016
Montego Bay, Jamaica

Opening: Monday 11 July at 10:00
Monday schedule: 10:00 – 13:00 and 14:00 – 17:00
Daily Schedule (Tuesday – Friday): 09:00-12:00 and 13:00-17:00
A half day field trip to the Ministries Montpelier Research Station is planned for Wednesday 13 July 2016

AGENDA

AGENDA ITEM	DOCUMENT NO.	PRESENTER
1. Opening of the meeting		
1.1 Welcome		IPPC Secretariat / Plant Quarantine Produce Inspection Branch, Jamaica NPPO
1.2 Selection of the Chairperson		IPPC Secretariat
1.3 Selection of the Rapporteur		CHAIRPERSON
1.3 Review and adoption of the agenda	01_TPDP_2016_Jul	CHAIRPERSON
2. Administrative Matters		CHAIRPERSON
- Local information - Documents list - Participants list (and membership)	02_TPDP_2016_Jul_Rev 03_TPDP_2016_Jul 04_TPDP_2016_Jul Link to TPDP membership list	GOLDSMITH MOREIRA MOREIRA
3. Scrutiny of draft diagnostic protocols		CHAIRPERSON
3.1 *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010) (Priority 2) - Summary of comments from expert consultation - Checklist for discipline leads and referees	2004-010 18_TPDP_2016_Jul 19_TPDP_2016_Jul	RODONI
3.2 *Puccinia psidii* (2006-018) (Priority 2) - Summary of comments from expert consultation - Checklist for discipline leads and referees	2006-018 08_TPDP_2016_Jul 09_TPDP_2016_Jul	DE GRUYTER
3.3 Begomoviruses transmitted by *Bemisia tabaci* (2006-023) (Priority 2) - Checklist for discipline leads and referees	2006-023 16_TPDP_2016_Jul	RODONI
3.4 *Xylella fastidiosa* (2004-024) (Priority 2) - Checklist for discipline leads and referees	2004-024 12_TPDP_2016_Jul	TAYLOR
4. Updates from relevant IPPC bodies		CHAIRPERSON

AGENDA ITEM	DOCUMENT NO.	PRESENTER
4.1 Updates from other relevant IPPC meetings - 11th session of the Commission on Phytosanitary Measures (CPM-11, 2016) - Standards Committee (SC) May 2016	CPM - 11 Final Report (2016) 2016-05 Report of the Standards Committee	Steward (CHARD) / MOREIRA
5. Overview of the TPDP work programme		CHAIRPERSON
5.1 General overview of DPs and next steps	(presentation)	MOREIRA
5.2 General overview of status of protocols - Reports on individual DPs status by discipline leads (scope and status of protocols) - Review of DP drafting groups associated with the work programme	14_TPDP_2016_Jul Link to List of topics for IPPC Standards Link to IPPC DPs drafting groups list	Discipline leads / IPPC Secretariat
6. Procedures and guidance related to TPDP		CHAIRPERSON
6.1 TPDP procedures: - TPDP Working procedures - TPDP Instructions to authors (Checklist for authors, Criteria for prioritization of protocols and Draft standardized template for draft diagnostic protocols) - Checklist for discipline leads and referees	TPDP Working procedures TPDP Instruction to authors Checklist for discipline leads and referees (work area page)	IPPC Secretariat / Steward (CHARD)
7. Follow-up on actions from the TPDP previous meetings		
7.1 Best practices for sequencing	07_TPDP_2016_Jul	BARR
7.2 Negative extraction control	10_TPDP_2016_Jul	ANTHOINE
7.3 "Methods", "tests" and "assays"	06_TPDP_2016_Jul	ANTHOINE
7.4 Quality Assurance issues	13_TPDP_2016_Jul	BARR
7.5 Next generation sequencing	15_TPDP_2016_Jul	RODONI
7.6 Diagnostic protocols and viability of pests	11_TPDP_2016_Jul	ANTHOINE
7.7 Challenges and the importance of the TPDP work	05_TPDP_2016_Jul	Steward (CHARD)
7.8 TPDP work: review adopted DPs for the need to update	17_TPDP_2016_Jul	ALL
8. Liaison		
• European and Mediterranean Plant Protection Organization (EPPO) update on diagnostic protocols • International Organization for Standardization (ISO) • Global Taxonomy Initiative (GTI) of the CBD	-	PETTER JAMES BARR
09. TPDP work plans		

AGENDA ITEM	DOCUMENT NO.	PRESENTER
- TPDP 2016-2017 work plan	(To be prepared during the meeting)	IPPC Secretariat (MOREIRA)
10. Date and location of next meeting		CHAIRPERSON
11. Other business		CHAIRPERSON
12. Recommendations to the SC		CHAIRPERSON
13. Closing of the meeting - Evaluation of the meeting - Close		IPPC Secretariat CHAIRPERSON

Appendix 02 - Documents list

DOCUMENT NO.	AGENDA ITEM	DOCUMENT TITLE	POSTED
Draft Diagnostic Protocols			
2004-010	3.1	*Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010)	2016-06-29
2006-018	3.2	*Puccinia psidii* (2006-018)	2016-06-13
2006-023	3.3	Begomoviruses transmitted by *Bemisia tabaci* (2006-023)	2016-06-17
2004-024	3.4	*Xylella fastidiosa* (2004-024)	2016-06-16
Other documents			
01_TPDP_2016_Jul	1.3	Agenda	2016-06-02 (first version) 2016-06-17
02_TPDP_2016_Jul_Rev	2	Local information	2016-05-30 (first version) 2016-06-17
03_TPDP_2016_Jul	2	Documents list	2016-06-17
04_TPDP_2016_Jul	2	Participants list	2016-06-17
18_TPDP_2016_Jul	3.1	Summary of comments from expert consultation - *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010)	2016-06-29
19_TPDP_2016_Jul	3.1	Checklist for discipline leads and referees - *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010)	2016-06-XX
08_TPDP_2016_Jul	3.2	Summary of comments from expert consultation - *Puccinia psidii* (2006-018)	2016-06-13
09_TPDP_2016_Jul	3.2	Checklist for discipline leads and referees - *Puccinia psidii* (2006-018)	2016-06-13
16_TPDP_2016_Jul	3.3	Checklist for discipline leads and referees - Begomoviruses transmitted by *Bemisia tabaci* (2006-023)	2016-06-17
12_TPDP_2016_Jul_Rev	3.4	Checklist for discipline leads and referees - *Xylella fastidiosa* (2004-024)	2016-06-14
14_TPDP_2016_Jul	5.2	General overview of status of protocols - Reports on individual DPs status by discipline leads (scope and status of protocols)	2016-06-17
07_TPDP_2016_Jul	7.1	Best Practices for Sequencing	2016-06-13
10_TPDP_2016_Jul	7.2	Negative extraction control	2016-06-14

DOCUMENT NO.	AGENDA ITEM	DOCUMENT TITLE	POSTED
06_TPDP_2016_Jul	7.3	“Methods”, “tests” and “assays”	2016-06-13
13_TPDP_2016_Jul	7.4	Quality Assurance issues	2016-06-14
15_TPDP_2016_Jul	7.5	Next generation sequencing	2016-06-17
11_TPDP_2016_Jul	7.6	Diagnostic protocols and viability of pests	2016-06-14
05_TPDP_2016_Jul	7.7	Challenges and the importance of the TPDP work	2016-06-09
17_TPDP_2016_Jul	7.8	TPDP work: review adopted DPs for the need to update	2016-06-17

Appendix 03 - Participants list

A check (✓) in column 1 indicates confirmed attendance at the meeting.

	Participant role	Name, mailing, address, telephone	Email address	Term begins	Term ends
TPDP members					
✓	Steward	**Ms Jane Chard** SASA, Scottish Government Roddinglaw Road Edinburgh EH12 9FJ **United Kingdom** Tel: (+44) 131 2448863 Fax: +44 131 2448940	jane.chard@sasa.gsi.gov.uk		
✓	Bacteriology	**Mr Robert Taylor** Ministry for Primary Industires, Plant Health and Environment Laboratory 231 Morrin Road St Johns PO Box 2095 Auckland 1140 **New Zealand** Tel: (+64) 9 909 3548 Fax: (+64) 9 909 5739	Robert.Taylor@mpi.govt.nz;	May 2011	2021 (2nd term 2016-2021)
	Botany	**Ms Liping Yin** Plant Quarantine Laboratory Animal and Plant Inspection and Quarantine Technology Center Shanghai Entry-Exit Inspection and Quarantine Bureau 1208 Minsheng Road Shanghai, 200135 **China** Tel: (+86) 21 6854 6481 Fax: (+86) 21 6854 6481	yinlp@shciq.gov.cn; yinlp2013@hotmail.com	April 2008	2018 (2nd term 2013-2018)
✓	Entomology	**Mr Norman B. Barr** USDA-AHPIS Assistant Director Mission Laboratory 22675 N. Moorefiled Rd. Moore Air Base Bldg. S-6414 Edinburg, TX 78541 **USA** Tel. (+1) 956 205 7658 Fax: (+1) 956 205 7680	Norman.B.Barr@aphis.usda.gov	July 2012	2022 (2nd term 2017-2022)
✓	Entomology	**Ms Juliet Goldsmith** Plant Health Specialist, Caribbean Agricultural Health and Food Safety Agency (CAHFSA) Letitia Vriesdelaan 10, Paramaribo, Suriname Tel: 1876-9777160 Fax: 1876-9776992	julietgoldsmith@gmail.com Juliet.goldsmith@cahfsa.org	November 2014	2019

	Participant role	Name, mailing, address, telephone	Email address	Term begins	Term ends
✓	Mycology	**Mr Johannes de Gruyter** Team manager diseases Plant Protection Service (NPPO) 15 Geertjesweg P.O. Box 9102 6706 HC Wageningen **Netherlands** Tel: (+31) 317 496 831 Fax: (+31) 317 421 701	j.degruyter@nvwa.nl	April 2008	2018 (2nd term 2013-2018)
✓	Nematology	**Ms Géraldine Anthoine** Directrice adjointe / Deputy head Chef d'unité coordination de la référence / Head of unit "coordination of reference activities" 7 rue Jean Dixméras 49044 ANGERS cedex 01 **France** Tel: (33) 241207431 Fax: (33) 240207430	geraldine.anthoine@anses.fr	April 2009	2019 2nd term 2014- 2019)
✓	Virology	**Mr Delano James** Head, Research Section, Canadian Food Inspection Agency Sidney Laboratory 8801 East Saanich Road Sidney, BC, V8L 1H3 **Canada** Tel: (+1) 250 363 6650 ext 235 Fax: (+1) 250 363 6661	Delano.James@inspection.gc.ca	Nov. 2010	2020 (2nd term 2015- 2020)
✓	Virology, and backup bacteriology	**Mr Brendan Rodoni** Biosciences Research Branch AgriBio Centre Ring Road La Trobe University Bundoora 3083 **Australia** Tel: (+61) 3 9032 7319 Fax: (+61) 3 9800 3521	brendan.rodoni@ecodev.vic.gov.au	July 2012	2017

Other participants			
✓	Invited Expert	**Ms Françoise PETTER** European and Mediterranean Plant Protection Organization (EPPO) 21 boulevard Richard Lenoir 75011 Paris France Tel: +33 1 45 20 77 94 / Fax: +33 1 70 76 65 47	petter@eppo.int

✓	Host/Organizer	**Ms Peta Gaye CHANG** Chief Post Entry Quarantine Officer Ministry of Industry Commerce, Agriculture and Fisheries Bodles Research Station, Old Harbour, St. Catherine, Jamaica Phone: 876470 6757	pgschang@hotmail.com
✓	Host/Organizer	**Ms Tracy Ann SALMON SMITH** Plant Quarantine Officer Agricultural Export Complex Montego Bay, Jamaica Phone 391-4242/940-4146	salmonandas@yahoo.com
✓	IPPC Secretariat	**Ms Adriana G. MOREIRA** Agricultural Officer / Standard Setting Programme Specialist International Plant Protection Convention Secretariat (IPPC) Food and Agriculture Organization of the United Nations (FAO/UN) Viale delle Terme di Caracalla 00153 Rome, Italy Phone: + 39 06 570 55 809	Adriana.Moreira@fao.org
✓	IPPC Secretariat	**Ms Stephanie DUBON** 4700 River Road, Unit 130, Riverdale, MD 20737 Phone: Office: 301-851-2180 Cell: 301-332-9071	Stephanie.Dubon@fao.org

Appendix 04 - TPDP 2016 / 2017 tentative work plan

Action 1: 2016-2017 Diagnostic Protocols (DPs) overall management **Goals: a)** Track, manage and ensure high quality DPs **b)** Overall management of 22 draft DPs				
Activities	**Start Date**	**Due Date**	**Related Steps**	**Responsible**
DP drafting groups management: TPDP members to update lead authors and DP drafting groups on the outcomes of the 2016 TPDP meeting and inform the deadlines for the lead authors.	18 July 2016	On going	-	TPDP members
Draft DPs for approval for DP Notification Period				
Draft DPs under DP Notification Period (01 July – 15 August 2016) 1. *Erwinia amylovora* (2004-009) 2. Genus *Liriomyza* (2006-017) 3. *Citrus tristeza virus* (2004-021) 4. Aphelenchoides (2006-025) 5. *Xanthomonas fragariae* (2004-012) 6. *Tomato spotted wilt virus* (TSWV*), Impatiens necrotic spot virus* (INSV) and *Watermelon silver mottle virus* (WSMoV) (2004-019)	01 July 2016	15 August 2016	-	Secretariat
TPDP e-decisions: Draft DPs to SC for approval for adoption (DP notification period 15 December 2016 – 30 January 2017) 1. *Anguina* spp. (2013-003) 2. *Sorghum halepense* (2006-027)	26 September 2016	06 October 2016	• **29 August 2016:** Revised draft DP + responses to member comments to the Secretariat • **31 Aug – 14 Sep 2016:** IPPC editor • **26 Sep 2016:** Revised draft DP back to the Secretariat • **26 Sep 2016:** Open TPDP e-decision	• Respective discipline lead • Secretariat • Respective discipline lead • Secretariat
TPDP e-decisions: Draft DPs to SC for approval for adoption (DP notification period 15 December 2016 – 30 January 2017) 1. *Fusarium circinatum* (2006-021) 2. *Dendroctonus ponderosae* (2006-019) 3. *Candidatus* Liberibacter solanacearum (2013-001)	16 November 2016	23 November 2016	• **28 October 2016:** Revised draft DP + responses to member comments to the Secretariat • **01-07 November 2016:** IPPC editor • **15 November:** Revised draft DP back to the Secretariat • **16 November 2016:** Open TPDP e-decision	• Respective discipline lead • Secretariat • Respective discipline lead • Secretariat

Action 1: 2016-2017 Diagnostic Protocols (DPs) overall management **Goals: a)** Track, manage and ensure high quality DPs **b)** Overall management of 22 draft DPs				
TPDP e-decisions: Draft DPs to SC for approval for adoption (DP notification period 01 July 2017 – 15 August 2017) 1. *Phytophthora ramorum* (2004-013)	23 January 2017	27 February 2017	• **28 November 2016:** Revised draft DP back to the Secretariat • **30 November 2016- 15 December 2016:** IPPC editor • **20 January 2017:** Revised draft DP back to the Secretariat • **23 January 2017:** Open TPDP e-decision	• Respective discipline lead • Secretariat • Respective discipline lead • Secretariat
Draft DPs for approval for consultation period				
TPDP e-decisions: DPs intended to be submitted to the July 2017 consultation period 1. *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010) 2. *Puccinia psidii* (2006-018)	23 January 2016	06 February 2017	• **22 November 2016:** Revised draft DP back to the Secretariat • **30 November 2016- 15 December 2016:** IPPC editor • **16 January 2017:** Revised draft DP back to the Secretariat • **23 January 2017:** Open TPDP e-decision	• Respective discipline lead • Secretariat • Respective discipline lead • Secretariat

Action 1: 2016-2017 Diagnostic Protocols (DPs) overall management **Goals: a)** Track, manage and ensure high quality DPs **b)** Overall management of 22 draft DPs				
TPDP e-decisions: DPs intended to be submitted to the July 2017 consultation period* 1. *Xylella fastidiosa* (2004-024) *2. Begomoviruses transmitted by Bemisia tabaci* (2006-023) **Note: draft DPs going for Expert Consultation on 14 October 2016*	20 February 2017	06 March 2017	• **07 October 2016:** Revised draft DP back to the Secretariat • **14 Oct – 01 Dec 2016:** Expert Consultation • **10 January 2017:** Revised draft DP back to the Secretariat (based on expert's comments) • **15 – 30 January 2017:** IPPC editor • **15 February 2017:** Revised draft DP back to the Secretariat • **20 February 2017:** Open TPDP e-decision	• Respective discipline lead • Secretariat • Respective discipline lead • Secretariat • Respective discipline lead • Secretariat
TPDP face to face meeting 2017 Tentative agenda*: 1. Genus *Ceratitis* (2016-001) 2. *Striga* spp. (2008-009) 3. *Bactrocera dorsalis complex* (2006-026) 4. *Conotrachelus nenuphar* (2013-002) 5. *Ips* spp. (2006-020) **Note: draft DPs going for Expert Consultation – see section below*	13 February 2017	17 February 2017	*(Draft DPs going for Expert Consultation – see section below)*	TPDP members and Secretariat
TPDP virtual meetings (tentative) • 06 September 2016 • 03 November 2016 • 07 December 2016 • 01 March 2017	-	-	(see below: Expert consultation)	Secretariat and TPDP members

Action 2: Call for Authors **Goals:** Collect nominations of experts around the world to help the development of ensure high quality DPs.				
Activities	**Start Date**	**Due Date**	**Related Steps**	**Responsible**
Genus *Ceratitis* (2016-001)	Fourth quarter of 2016	Fourth quarter of 2016	Open call for authors (entomologists, with experience in morphology)	Secretariat

Action 3: Expert Consultation on draft Diagnostic Protocols (ECDPs) **Goals: a)** Ensure improvement on quality for the development of DPs, through inputs and feedback, in a scientific basis, from a wider number of experts worldwide not part of the DP drafting groups **b)** Facilitate the work to submit 7 DPs to the Expert Consultation on draft Diagnostic Protocols				
Activities	**Start Date**	**Due Date**	**Related Steps**	**Responsible**
First 2016 ECDPs 1. *Candidatus* Liberibacter spp. *Liberibacter* spp. / *Liberobacter* spp. on *Citrus* spp. (2004-010) 2. *Puccinia psidii* (2006-018)	15 April 2016	15 May 2016	(Done)	Respective discipline lead and Secretariat
Second 2016 ECDPs: Tentative: *1.* *Xylella fastidiosa* (2004-024) 2. *Begomoviruses transmitted by Bemisia tabaci* (2006-023) 3. *Striga* spp. (2008-009) 4. *Bactrocera dorsalis complex* (2006-026) *5.* *Ips* spp. (2006-020)	14 October 2016	01 December 2016	Draft to Secretariat: **07 October 2016**	Respective discipline lead and Secretariat
Third 2016 ECDPs: 1. *Conotrachelus nenuphar* (2013-002)	30 November 2016	06 January 2017	Draft to Secretariat: **15 October 2016**	Respective discipline lead and Secretariat

Action 4: 2017 TPDP face to face meeting (Tentative: 13-17 February 2017) **Goal:** Discuss deeply the technical content of draft DPs, as well as challenges and strengthens of the panel and review the TPDP work programme.				
Activities	**Start Date**	**Due Date**	**Related Steps**	**Responsible**
Tentative agenda: 1. Genus *Ceratitis* (2016-001) 2. *Striga* spp. (2008-009) 3. *Bactrocera dorsalis complex* (2006-026) 4. *Conotrachelus nenuphar* (2013-002) 5. *Ips* spp. (2006-020)	13 February 2017	17 February 2017	(see above: Diagnostic Protocols (DPs) overall management and Expert consultation) • Draft DPs back to Secretariat: 10 January 2017	TPDP members and Secretariat

Action 5: Consultation Period on draft ISPMs **Goals: a)** To ensure a transparent and inclusive process for the development of high quality DPs **b)** Facilitate the work to submit draft DPs to the consultation period				
Activities	**Start Date**	**Due Date**	**Related Steps**	**Responsible**
2016 February Consultation: 1. *Dendroctonus ponderosae* (2006-019) 2. *Anguina* spp. (2013-003)	01 February 2016	30 June 2016	(see above: Diagnostic Protocols (DPs) overall management and Expert consultation)	Respective Discipline lead and Secretariat
2016 July Consultation Period *1. Candidatus Liberibacter solanacearum* (2013-001) *2. Phytophthora ramorum* (2004-013) *3. Fusarium circinatum* (2006-021)	01 July 2016	30 September 2016	(see above: Diagnostic Protocols (DPs) overall management and Expert consultation)	Respective Discipline lead and Secretariat
2017 July Consultation Period (tentative): 1. *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010) 2. *Puccinia psidii* (2006-018) 3. *Begomoviruses transmitted by Bemisia tabaci* (2006-023) 4. *Xylella fastidiosa* (2004-024) 5. Genus *Ceratitis* (2016-001) 6. *Striga* spp. (2008-009) 7. *Bactrocera dorsalis complex* (2006-026) 8. *Conotrachelus nenuphar* (2013-002) 9. *Ips* spp. (2006-020)	01 July 2017	30 September 2017	(see above: Diagnostic Protocols (DPs) overall management and Expert consultation)	Respective Discipline lead and Secretariat

Action 6: Notification period for draft DPs **Goals: a)** To ensure a transparent and inclusive process for the adoption of draft DPs **b)** Facilitate the work to recommend draft DPs to the Standards Committee for adoption				
Activities	**Start Date**	**Due Date**	**Related Steps**	**Responsible**
Draft DPs under DP Notification Period (01 July – 15 August 2016) 1. *Erwinia amylovora* (2004-009) 2. Genus *Liriomyza* (2006-017) 3. *Citrus tristeza virus* (2004-021) 4. Aphelenchoides (2006-025) 5. *Xanthomonas fragariae* (2004-012) 6. *Tomato spotted wilt virus* (TSWV*), Impatiens necrotic spot virus* (INSV) and *Watermelon silver mottle virus* (WSMoV) (2004-019)	01 July 2016	15 August 2016	(see above: Diagnostic Protocols (DPs) overall management and Consultation Period)	Respective Discipline lead and Secretariat
Draft DPs for approval for the 15 December 2016 – 30 January 2017 DP Notification Period *1. Dendroctonus ponderosae* (2006-019) *2. Anguina* spp. (2013-003) *3. Candidatus Liberibacter solanacearum* (2013-001) 4. *Fusarium circinatum* (2006-021) *5. Sorghum halepense* (2006-027)	15 December 2016	30 January 2017	(see above: Diagnostic Protocols (DPs) overall management and Consultation Period)	Respective Discipline lead and Secretariat
Draft DPs for approval for the 01 July 2017 – 15 August 2017 DP Notification Period *1. Phytophthora ramorum* (2004-013)	01 July 2017	15 August 2017	(see above: Diagnostic Protocols (DPs) overall management and Consultation Period)	Respective Discipline lead and Secretariat
Draft DPs for approval for the 15 December 2017 – 30 January 2018 DP Notification Period (tentative): 1. *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010) 2. *Puccinia psidii* (2006-018) 3. *Begomoviruses transmitted by Bemisia tabaci* (2006-023) 4. *Xylella fastidiosa* (2004-024) 5. Genus *Ceratitis* (2016-001) 6. *Striga* spp. (2008-009) 7. *Bactrocera dorsalis complex* (2006-026) 8. *Conotrachelus nenuphar* (2013-002) 9. *Ips* spp. (2006-020)	15 December 2017	30 January 2018	(see above: Diagnostic Protocols (DPs) overall management and Expert Consultation Period)	Respective Discipline lead and Secretariat

Appendix 05 – Action points arising from the July 2016 TPDP meeting

	Action	Agenda Item	Responsible	Deadline
1.	TPDP members *invited* Mr Robert TAYLOR (as lead) and Ms Geraldine ANTHOINE to develop a paper on ELISA controls and interpretation of results for the next face-to-face meeting.	3	Mr Robert TAYLOR (as lead) and Ms Geraldine ANTHOINE	10 January 2016
2.	TPDP members *invited* the DP drafting group to consider the TPDP recommendations and adjust the draft DP for *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010). The draft DP should be revised again by the TPDP via e-decision and recommended to the SC for approval for the consultation period.	3.1	Discipline lead and DP drafting group	22 November 2016
3.	TPDP members *invited* the DP drafting group to consider the TPDP recommendations and adjust the draft DP for *Puccinia psidii* (2006-018). The draft DP should be revised again by the TPDP via e-decision and be recommended to the SC for approval for the consultation period.	3.2	Discipline lead and DP drafting group	22 November 2016
4.	The TPDP *invited* the discipline lead and the referee to adjust the draft DP for Begomoviruses transmitted by *Bemisia tabaci* (2006-023) The draft DP will then be submitted to the Expert Consultation period. Following this step, the draft DP should then be presented to the TPDP via e-decision for approval for the consultation period.	3.3	Discipline lead and referee	07 October 2016
5.	The TPDP *invited* the discipline lead and the referee to consider the TPDP recommendations, adjust the draft DP for *Xylella fastidiosa* (2004-024). The draft DP will then be submitted to the Expert Consultation. The draft DP should then be presented to the TPDP via e-decision for recommendation to the SC for approval for the consultation period.	3.4	Discipline lead and referee	07 October 2016
6.	TPDP members *asked* the Secretariat to open a call for authors for the draft DP for Genus *Ceratitis* (2016-001), with focus on morphological expertise, noting that more than one autor may be selected.	4.1	Secretariat	Fourth quarter of 2016
7.	Draft DPs to be submitted to the DP notification period 2016-2017 **Group A (DP notification period 15 Dec 2016):** 1. *Anguina* spp. (2013-003) 2. *Sorghum halepense* (2006-027) **Group B (DP notification period 15 Dec 2016):** 1. *Fusarium circinatum* (2006-021) 2. *Dendroctonus ponderosae* (2006-019) 3. *Candidatus* Liberibacter solanacearum (2013-001) **Group C (DP notification period 01 July 2017):** 1. *Phytophthora ramorum* (2004-013)	5.2	TPDP members (discipline leads and referees)	**Group A:** 29 August 2016 draft DP + responses to comments back to Secretariat **Group B:** 28 October 2016 draft DP + responses to comments back to Secretariat **Group C:** 28 November 2016 draft DP + responses to comments back to Secretariat

	Action	Agenda Item	Responsible	Deadline
8.	Draft DPs to be submitted to the consultation period 2017 (July 2017) **Group A:** 1. *Candidatus* Liberibacter spp. on *Citrus* spp. (2004-010) 2. *Puccinia psidii* (2006-018) **Group B:** 1. *Xylella fastidiosa* (2004-024) 2. *Begomoviruses transmitted by Bemisia tabaci* (2006-023) **Group C:** 1. Genus *Ceratitis* (2016-001) 2. *Striga* spp. (2008-009) 3. *Bactrocera dorsalis complex* (2006-026) 4. *Ips* spp. (2006-020) **Group D:** 1. *Conotrachelus nenuphar* (2013-002)	5.2	TPDP members (discipline leads and referees)	**Group A:** 22 November 2016 draft DP back to Secretariat **Group B:** 07 October 2016 draft DP back to Secretariat (to Expert Consultation Period) **Group C:** 07 October draft DP back to Secretariat (to Expert Consultation Period) **Group D:** 15 October draft DP back to Secretariat (to Expert Consultation Period)
9.	Draft DPs to be discussed at the next face to face meeting (tentative: February 2017) 1. Genus *Ceratitis* (2016-001) 2. *Striga* spp. (2008-009) 3. *Bactrocera dorsalis complex* (2006-026) 4. *Conotrachelus nenuphar* (2013-002) 5. *Ips* spp. (2006-020)	5.2	TPDP members (discipline leads and referees)	10 January 2016
10.	TPDP members are encouraged to submit comments to the lead Mr Norman BARR in relation to his paper on best practices for sequencing.	7.1	TPDP members	15 September 2016
11.	TPDP members asked Ms Geraldine ANTHOINE to prepare a document with control options for each pest group (i.e. each discipline) and present in a virtual meeting	7.2	Géraldine ANTHOINE	No deadline set
12.	TPDP members asked the Secretariat to propose a text adjustment to the Instructions to Authors.	7.2	Secretariat	No deadline set
13.	TPDP are encouraged to submit comments to the lead Mr Norman BARR in relation to his paper on quality assurance issues.	7.4	TPDP members	15 September 2016
14.	TPDP members *asked* Mr Brendan RODONI to draft a document (The use of Next generation sequencing as a diagnostic tool for the next TPDP face to face meeting with more focus on possible guidelines to be included in IPPC DPs.	7.5	Mr Brendan RODONI	10 January 2017
15.	TPDP members *asked* Mr Brendan RODONI and Ms Françoise PETTER to try contact the ICTV and follow-up the outcomes of their discussions on this matter and share with the TPDP, via the Secretariat	7.5	Mr Brendan RODONI and Ms Françoise PETTER	No deadline set
16.	TPDP members *asked* the Secretariat to share the discussions on the use of next generation sequencing (NGS) as a diagnostic tool and raise awareness with the SC at their next meeting.	7.5	Secretariat	Next SC meeting

	Action	Agenda Item	Responsible	Deadline
17.	TPDP members *asked* the Secretariat to share the discussions on diagnostic protocols and the viability of pests and raise awareness with the SC at their next meeting.	7.6	Secretariat	Next SC meeting
18.	TPDP members *invite* the SC to consider including the subject "revision of DP 2: *Plum pox virus*", with priority 1, into the TPDP work programme due to recent findings of new strains of the virus that are not covered in the adopted version of the DP.	7.8	Standards Committee	Next SC meeting
19.	TPDP members *asked* Mr Delano JAMES to prepare a summary with the main points for the need to perform a revision to the DP 2: *Plum pox virus* to be presented to the SC.	7.8	Mr Delano JAMES	30 September 2016
20.	TPDP members *asked* the Secretariat to present the summary on the need for a revision to the DP 2: *Plum pox virus* to the SC as soon as possible.	7.8	Secretariat	Next SC meeting
21.	TPDP members *asked* Mr Delano JAMES to contact the convener to ask if it is possible to share the draft standard (*General requirements for molecular biology analysis for detection and identification of destructive organisms in plants and derived products)*, once submitted for voting, with the TPDP for their appreciation.	8	Mr Delano JAMES	No deadline set
22.	TPDP members *invite* the SC to consider Ms Françoise PETTER (EPPO) to be invited to the 2017 TPDP face-to-face meeting, as an invited expert.	10	Secretariat	Next SC meeting