



Introduction for authors of IPPC Diagnostic Protocols

This brochure illustrates what the International Plant Protection Convention (IPPC) Diagnostic Protocols (DPs) for regulated pests are, the process through which they are developed and adopted as well as the entities involved in it. An essential role is played by the DP authors, competent diagnosticians nominated by IPPC contracting parties and regional plant protection organizations (RPPOs) and selected by the experts of the Technical Panel on Diagnostic Protocols (TPDP), who draft the DPs.

It is known that proper pest detection and pest identification are crucial for the appropriate application of phytosanitary measures. The IPPC DPs provide procedures and methods for the official diagnosis of regulated pests that are relevant for international trade. They 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 for which a diagnostic protocol may be used.

The International Plant Protection Convention (IPPC)

The IPPC was established to secure cooperation among contracting parties to protect global plant resources from the spread and introduction of pests of plants, in order to preserve food security, biodiversity and to facilitate trade.

The strategic objectives of the IPPC Strategic Framework are to:

- enhance global food security and increase sustainable agricultural productivity;
- protect the environment from the impacts of plant pests; and
- facilitate safe trade, development and economic growth.

Organizational structure and function

The Commission on Phytosanitary Measures (CPM) is the IPPC's governing body.

Diagnostic Protocols (DPs) drafting groups

- DPs are developed by a DP drafting group made up of a lead author and co-authors.
- Each DP drafting group is led by a TPDP member (discipline lead).
- DP drafting groups work through e-mail discussions.

Technical Panel on Diagnostic Protocols (TPDP)

The TPDP is a sub-committee of the SC and is responsible for:

- Developing DPs within the framework of International Standard for Phytosanitary Measures (ISPM) 27 *Diagnostic protocols for regulated pests*.
- Developing guidance on related issues.
- Providing guidance and oversight to the work of DP drafting groups.
- Selecting authors for the DP drafting groups.

Standards Committee (SC)

The SC is a subsidiary body of the CPM and is responsible for:

- Overseeing the IPPC Standard Setting Process.
- Managing the development of ISPMs.
- Providing guidance and oversight to the work of Technical Panels (TPs) and Expert Working Groups (EWGs).
- Selecting TP and EWG members.
- Adopting DPs on behalf of CPM.

IPPC contracting parties and RPPOs

- Contracting parties and RPPOs submit proposals for new topics, or revision of existing topics during the Call for Topics.
- Contracting parties and RPPOs provide comments to the draft DP through their respective official contact points during the consultation period.
- Contracting parties and RPPOs then review the SC-approved DPs and submit any possible objections during the DP notification period.

Diagnostic Protocol drafting groups

It takes 4-5 years from initiation of drafting to adoption.

Different inputs at different times

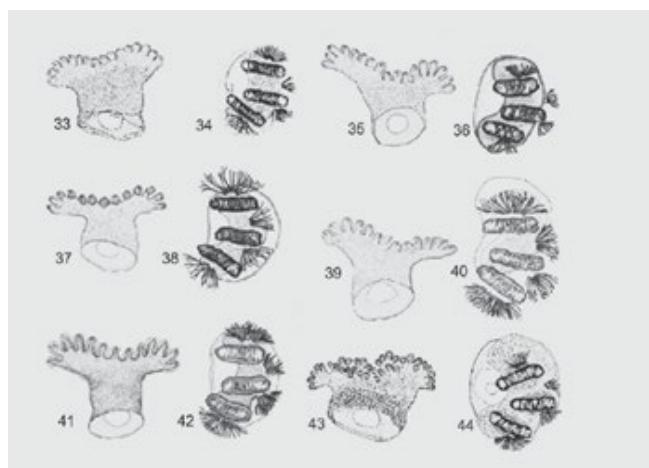
Inputs, comments and revisions to the draft DP are needed at several stages of development.

A globally harmonized protocol

DPs are not merely scientific publications but adopted international standards to which IPPC contracting parties have agreed.

The following documents are useful during the development of the DP:

- ISPM 27 *Diagnostic protocols for regulated pests*;
- Instruction to authors of DPs;
- TPDP working procedures;
- IPPC Procedure Manual for Standard Setting, including checklist for authors; and
- IPPC Style guide.



Detail of DP 9, ISPM 27. Anterior and posterior spiracles of third instar larvae of *Anastrepha* species: (33, 34) *A. ludens*; (35, 36) *A. serpentina*; (37, 38) *A. obliqua*; (39, 40) *A. striata*; (41, 42) *A. suspensa*; and (43, 44) *A. grandis*. Source: All figures adapted from Carroll et al. (2004).

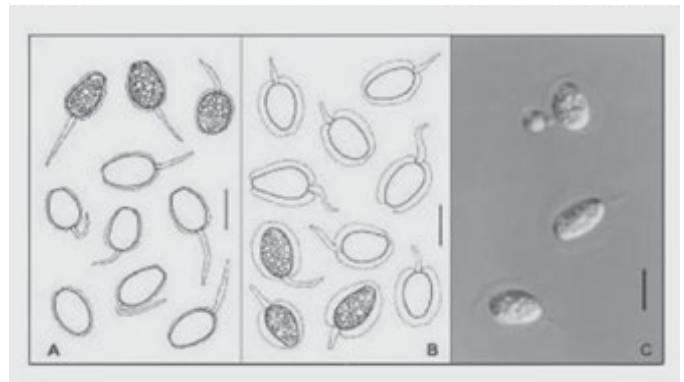
Diagnostic Protocols

General principles

- DPs provide the minimum requirements for reliable diagnosis of regulated pests.
- The methods are selected on the basis of their sensitivity, specificity and reproducibility.
- Availability of equipment, the expertise required for these methods and their practicability are also taken into account.
- Harmonization requires compromise.

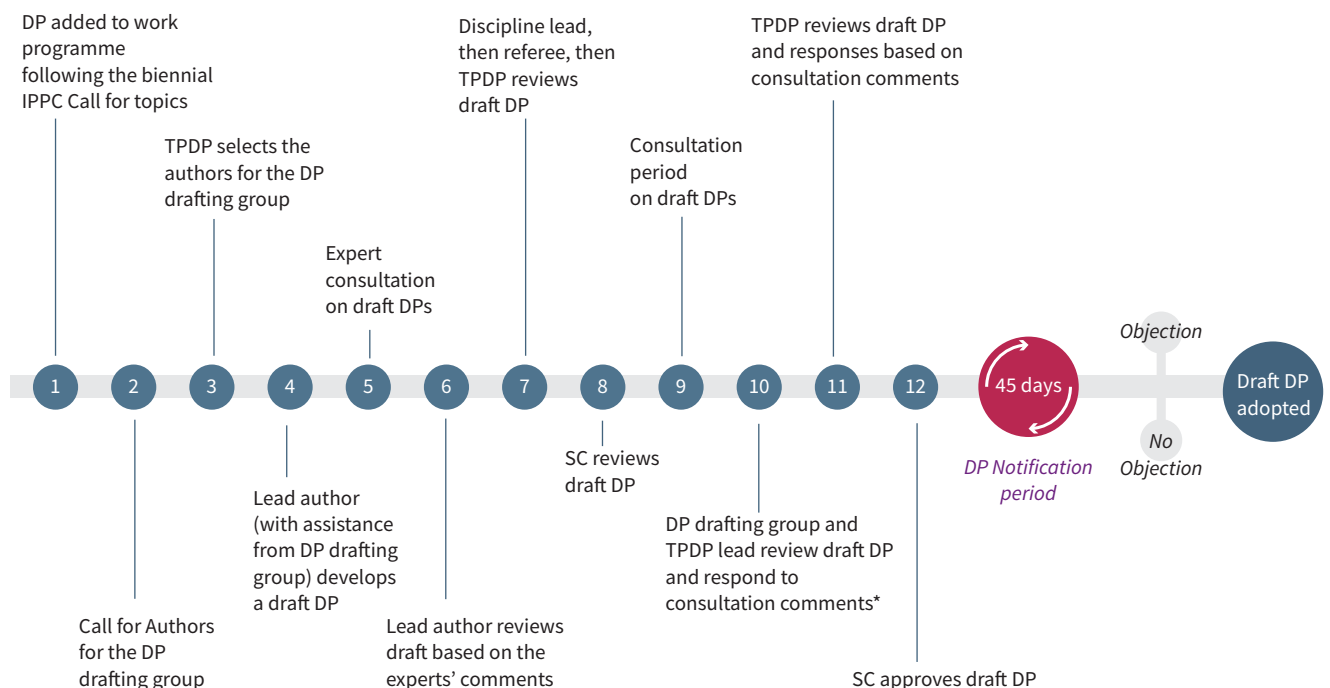
International standards

- The IPPC sets standards to reduce the spread and introduction of pests of plants. This is important to ensure safe and fair international trade.
- DPs that are adopted as annexes to ISPM 27 *Diagnostic protocols for regulated pests* are considered international standards.
- The World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) recognizes that phytosanitary measures which conform to the international standards developed under the IPPC as necessary to protect plant health.



Detail of DP 5, ISPM 27. Conidial morphology and cultural characteristics of *Phyllosticta citricarpa* and *Phyllosticta capitalensis*: (A) conidia of *P. citricarpa* with thin (<math><1.5 \mu\text{m}</math>) mucoïd sheath; (B, C) conidia of *P. capitalensis* with thick (>math>>1.5 \mu\text{m}</math>) mucoïd sheath (scale bar = 10 $\mu\text{m}</math>) (photo C was taken under a light microscope equipped with differential interference contrast). Photos courtesy G. Verkley, Centraalbureau voor Schimmelcultures, Utrecht, the Netherlands (A, B, C).$

How standard setting works for DPs



*The DP is edited at various stages, which requires additional reviews by the DP drafting group.

Case Study: Citrus Canker in Solomon Islands

How a diagnostic protocol saved the day

Citrus canker was detected for the first time in the Solomon Islands in 2010 through surveys by the Australian Department of Agriculture, Fisheries, Forestry and Biosecurity, Solomon Islands. Due to Australian plant health import requirements, only infected citrus material that had been deactivated could be returned to Australia and tested using PCR- based tests.

The PCR tests returned positive results and a draft disease note was submitted for publication. However, the journal would not publish these results due to the requirement to isolate a pure culture, deposit into a recognised culture collection, and conduct pathogenicity tests to verify Koch's postulates.

Biosecurity Solomon Islands were keen to have this record published to help support the integrity of their phytosanitary system in terms of surveillance and pest reporting.

In collaboration with the Australian Department of Agriculture and Biosecurity Solomon Islands, the infected citrus material was imported into laboratories (Physical Containment Level 2)

in New Zealand. While this laboratory had worked with many xanthomonad pathogens, they had not previously isolated *Xanthomonas citri* subsp. *citri* (Xcc) from infected plant material. By following the IPPC DP 6 that outlined methods for isolation, identification and pathogenicity, they were able to isolate the bacterium, validate the identification using biochemical and molecular tests, conduct pathogenicity testing and fulfil the requirements of Koch's postulates.

Xcc was particularly difficult to isolate from these samples due to culture plates being overcrowded by competing saprophytic bacteria and first attempts using standard bacteriological media was not successful.

A second attempt at isolation, using the methods and advice in the DP 6 on how to overcome this issue, resulted in the successful isolation of Xcc. They were then able to conduct pathogenicity tests using detached leaf assays (also described in the DP 6) in containment.



Davis, R.I., Taylor, R.K., Rouse, D. et al. *First record of citrus canker, caused by Xanthomonas citri subsp. citri in Solomon Islands.* Australasian Plant Dis. Notes 10, 9 (2015). <https://doi.org/10.1007/s13314-014-0156-8>

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- » [Technical Panel on Diagnostic Protocols \(TPDP\)](#)
- » [IPPC adopted standards](#)
- » [National Plant Protection Organizations \(NPPOs\)](#)
- » [Regional Plant Protection Organizations \(RPPOs\)](#)