



International Forestry Quarantine Research Group



International Meeting # 15

October 1 - 5, 2018, Rome, Italy

Meeting Report

NOVEMBER 20, 2018

INTERNATIONAL FOREST QUARANTINE RESEARCH GROUP
SCIENCE STEERING COMMITTEE

<https://www.ippc.int/en/external-cooperation/organizations-page-in-ipp/internationalforestryquarantineresearchgroup/>



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The Mission of IFQRG

The mission of the International Forestry Quarantine Research Group (IFQRG) is to support and address critical forestry quarantine issues for the global plant health community through scientific analysis, discussion and collaborative research.

IFQRG is an independent, open international body providing scientific analysis and review of global forestry-related phytosanitary issues. The IFQRG serves as a forum for the discussion and clarification of key issues related to the phytosanitary implications of global trade with forest plants and products.

IFQRG's goal is for membership to include global representation from scientific, industrial and phytosanitary organisations from both developed and developing nations. Membership is open to suitably qualified individuals who have demonstrated expertise in disciplines relevant to plant health. IFQRG endeavors to recruit members from all FAO regions.

To become a member of IFQRG, the individual submits a short biography or curriculum vitae to the Science Steering Committee (SSC) outlining research or other relevant experience. Membership applications will be accepted by the SSC if information on the applicant indicates they would be a suitable member of IFQRG. There is no membership fee.

Meeting Report

This report communicates the discussions and conclusions from the 2018 International meeting number 15 of the International Forestry Quarantine Research Group. The meeting was held at the headquarters of the Food and Agricultural of the United Nations (FAO) in Rome, from the 1st to the 5th of October, 2018. International Forestry Quarantine Research Group members and the executive committee thank the IPPC Secretariat of the FAO for their support of the meeting including use of the meeting facilities.

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List of Abbreviations

ALSC	American Lumber Standards Committee
APPPC	Asia Pacific Plant Protection Commission
CFIA	Canadian Food Inspection Agency
CLSAB	Canadian Lumber Standards Accreditation Board
CPM	IPPC Commission on Phytosanitary Measures
CRADA	Cooperative research and development agreement
CWPCA	Canadian Wood Pallet and Container Association
DH	Dielectric Heating
EAB	Emerald Ash Borer (<i>Agrilus planipennis</i>)
EDN	Ethanedinitrile (C ₂ N ₂)
EPPO	European Plant Protection Organisation
FPSA	Forest Products System Approach
HACCP	Hazard Analysis and Critical Control Points
HT	Heat Treatment
IFC	IPPC Implementation and Facilitation Committee
IFQRG	International Forestry Quarantine Research Group
IFU	Implementation and Facilitation Unit
IPPC	International Plant Protection Convention
IPRRG	International Pest Risk Research Group
IRSS	Implementation Review and Support System
ISPM	International Standards for Phytosanitary Measures
ISPM15	ISPM No. 15 <i>Regulation of wood packaging material in international trade</i>
ISPM28	ISPM No. 28 <i>Phytosanitary treatments for regulated pests</i>
ISPM42	ISPM No. 42 <i>Requirements for the use of Temperature Treatment as Phytosanitary Measures</i>
IUFRO	International Union of Forestry Research Organizations
IYPH	International Year of Plant Health
MBr	Methyl bromide
MW	Microwave
NAPPO	North American Plant Protection Organization
NEPPO	Near East Plant Protection Organization
NGS	Next Generation Sequencing
NPPO	National Plant Protection Organisation
OECD	Organisation for Economic Co-operation and Development
OTUs	Operational taxonomic units
PCE	Phytosanitary Capacity Evaluation
PMRG	Phytosanitary Measures Research Group

Report of the 15th Meeting of the International Forest Quarantine Research Group
October 1st -5th 2018, Rome, Italy



PWN	Pine Wood Nematode (<i>Bursaphelenchus xylophilus</i>)
RoP	Rules of Procedure
RPPO	Regional Plant Protection Organisation
SC	IPPC Standards Committee
SSC	IFQRG Science Steering Committee
STDF	Standards and Trade Development Facility
ToR	Terms of Reference
TPFQ	IPPC Technical Panel for Forest Quarantine
TPPT	IPPC Technical Panel for Phytosanitary Treatments
USDA-APHIS	United States Department of Agriculture- Animal and Plant Health Inspection

MEETING REPORT

1. Welcome Address

Mr. Brent Larson welcomed International Forest Quarantine Research Group (IFQRG) members. He explained that the IFQRG meeting has been held every other year in Rome. IFQRG has also been achieving good exposure when holding the meeting in other countries. IFQRG should have a solid structure and be transparent about its organisation to ensure people understand well the group's role.

Mr. Larson noted that standards have been developed based on research work conducted by the IFQRG members. The International Plant Protection Convention (IPPC) Secretariat is looking forward to the work of IFQRG on a manual for Dielectric Heating (DH).

2. Opening of the meeting

IFQRG Chair, Dr. Michael Ormsby, opened the meeting and welcomed all the participants. He then read the address sent by Dr. Eric Allen, IFQRG's Past-Chair.

3. Local Information

04_IFQRG-15_2018

4. Meeting logistics and arrangements

02_IFQRG-15_2018

Mr. Larson and Dr. Ormsby provided meeting logistics and encouraged working groups to factor in time outside the meeting schedule to discuss their specific topics. All presenters were invited to share their abstracts to be included in the Abstracts document and to be used in the meeting report.

5. Introductions

07_IFQRG-15_2018
40_IFQRG-15_2018

Introductions were made around the room. The list of participants was updated at the end of the meeting based on actual presence (see Appendix 1).



6. Review and adoption of agenda

01_IFQRG_15_2018

6.1 List of Documents

03_IFQRG-15_2018
06_IFQRG-15_2018

A list of documents tabled at or presented to the meeting is provided in Appendix 2.



6.2 Selection of secretary and rapporteur

Meeting participants agreed that Dr. Kelli Hoover should act as secretary for the meeting and Dr. Maya Nehme as rapporteur.

7. Report of the 2017 IFQRG-14 meeting

05_IFQRG-15_2018

7.1 Review of action items

A1. Report on data on wood packaging storage patterns will be posted on IFQRG website.

Action Item 01: *Moved to next year's action plan (Ormsby)*

A2. Establish working group with regional representation to draft an IFQRG strategy document. Undertake a survey of wider IFQRG and National Plant Protection Organization/Regional Plant Protection Organisation (NPPO/RPPO) for input into the strategy.

Survey completed - Presentation of preliminary results on Tuesday morning

A3. Establish process for regular intersessional updates on IFQRG actions.

Action Item 02: *Moved to next year's action plan (SSC)*

A4. Finalize IFQRG Terms of Reference (ToR) and Rules of Procedure (RoP), and post on IFQRG website

ToR and RoP have been drafted. Working group will finalize during this meeting

A5. IFQRG members are encouraged to check the IPPC web page (IPP) for information on what is available for input and provide comments via their IPPC official contact point

Action Item 03: *Continuous item (All members).*

A6. IFQRG members are encouraged to suggest new topics for International Standards for Phytosanitary Measures (ISPMs) to their IPPC official contact point in response to the biannual call for topics

No topics submitted last year. IFQRG members are encouraged to submit topics in the next call for topics.

A7. Develop a document for the IPPC Technical Panel for Phytosanitary Treatments (TPPT) on scientific evidence supporting the efficacy of 56°C for 30 min on pests potentially associated with wood chips. April 2018 deadline.

The working group did some research on the topic. However, at its last meeting in June 2018 the TPPT rejected the treatment. The topic will be discussed further during this meeting and remains open for discussion on whether IFQRG members want to work more on it.

A8. If IFQRG members are aware of good policies for managing the implementation of ISPM No. 15 *Regulation of wood packaging material in international trade (ISPM15)*, then please submit to the IPPC Implementation and Facilitation Committee (IFC) for consideration for posting so others know how it is done elsewhere in the world.

IFQRG is working on developing guidance documents during and after this meeting, and later during the meeting IFQRG will discuss the potential submission to IFC for posting.



- A9. Report on development in the feasibility of solar kilns and report to the IFQRG chair.
Jamie Nicholls provided an introductory document to Chris Howard. In summary, there is a lack of available information to make a comparison. The document will be discussed with the IFQRG chair and potentially presented during this meeting.
- A10. Report IFQRG responses to Nairobi ISPM 15 Workshop questions to the researcher of the Standards and Trade Development Facility (STDF) study.
No feedback received from Eric Allen as yet. Luca Tasciotti will follow up on this action item. Ron Mack clarified that part of the response will be the guide on heat treatment that is being developed.
- A11. IFQRG members are encouraged to look at standards and use the expertise of the group to identify implementation challenges and possible solutions and submit this to their IPPC contact point for consideration by the IFC.
IFQRG identified during the last year issues that need further work. IFQRG chair encouraged further identification of issues that would require IFQRG's support and communication with IFC on those.
- A12. IFQRG members are encouraged to improve communication about the availability of the ISPM15 explanatory document
IFQRG chair reiterated the need to encourage users in each country to check the explanatory document for ISPM 15
- A13. IFQRG to develop a concept paper to characterize the risk of fungal movement on wood in international trade.
The working group initiated work on the paper during the meeting that was held in New Zealand. The paper was restructured to focus on the few fungi that are standing out in trade, studying the factors affecting their impact. The paper is expected to be ready by the next IFQRG meeting. Adnan Uzunovic proposed to have a presentation on this topic during the week.
- A14. Follow-up with IPPC Secretariat to help communicate to scientists, information on the development program for ISPMs on Diagnostic Protocols.
Adnan Uzunovic reiterated the idea discussed during last meeting concerning the gap between scientists developing diagnostic tools and protocols and IPPC and the need to create a link between the two. To be discussed further during this meeting.
- A15. IFQRG members are willing to help out with Bayesian modelling if needed.
Not an action item. Willingness remains.
- A16. Please log onto the website of the International Pest Risk Research Group (IPRRG) and keep track of their work (<http://www.pestrisk.org/>).
IFQRG chair encouraged everyone to keep checking the IPRRG website
- A17. IFQRG to develop guidance on the application of DH for wood and wood packaging material for submission to the IFC.
Updates on this action item will be provided during the session related to this topic during the meeting. A draft document related to this topic is posted on the IFQRG work area.



7.2 IFQRG Terms of Reference (ToR) and Rules of Procedure (RoP)

08_IFQRG-15_2018
09_IFQRG-15_2018

A working group composed of the IFQRG Science Steering Committee (SSC) along with Meghan Noseworthy, Ivan Veljkovic, Maya Nehme and Ian Gear met during the week to finalize a draft of the ToR and RoP.

The final drafts of both documents were presented on Friday morning to IFQRG members and adjusted based on their input.

Conclusion: The motion to adopt the ToR and RoP for IFQRG was moved by Kelli Hoover and seconded by Brad Gething. After discussion the motion was approved by those attending the meeting on the morning of Friday the 5th of October, 2018, with no objections.

The adopted ToR and RoP are attached to this report (Appendices 2 and 3 respectively).

Action Item 04: SSC to post the approved ToR and RoP documents on the IFQRG website (SSC).

8. Update of other bodies

8.1 Update from the Standard Setting Unit of the IPPC Secretariat (including TPPT & TPFQ)

12_IFQRG-15_2018

General updates were provided by the IPPC Secretariat, more specifically on the work of the TPPT and the IPPC Technical Panel for Forest Quarantine (TPFQ). Updates started with some background explaining that IFQRG's role is mostly seen as a support for IPPC Commission on Phytosanitary Measures (CPM) priorities in forest quarantine. The IPPC Standards Committee (SC), one of the subsidiary bodies of the CPM, supervises the long process of standard adoption. The drafting stage is where there might be synergies with IFQRG. Drafting the standards is usually done by technical groups such as the TPPT and TPFQ, composed of experts from contracting parties.

The TPPT has an open call for phytosanitary treatments, for which they had received several submissions (info on those submissions are available in 12_IFQRG-15_2018). Submissions should be made through the country contact person (a list of those people is available on the IPPC website (<https://www.ippc.int/en/>)). Submitted phytosanitary treatments are required to demonstrate a suitable level of efficacy. The TPPT usually evaluates the submissions and decides whether they could be accepted as annexes to ISPM No. 28 *Phytosanitary treatments for regulated pests* (ISPM28), and if so recommends their adoption to the SC. A clarification was made on the distinction between, standards, annexes and appendices, the first two being prescriptive while the latter is not.

- On the phytosanitary treatment submitted for the heat treatment of wood chips, a clarification was provided that the two issues with this submission were; the lack of scientific efficacy data to support the submission, and the fact that the submission focused on technology rather than treatment. TPPT doesn't approve technology, they approve treatments, while technologies can be added as "contributing documents" to the resources page on the IPPC website. It was also explained, in response to questions in this regard, that research data can be submitted through the NPPO to IPPC to be added to the existing application, in which case the application can be re-looked at and TPPT would then approve it as long as data follows the criteria set in ISPM 28 in terms of accuracy. Data can be generated on pest groups or individual pests, but it is essential



to have data that the TPPT can base its decision on. TPPT also considers feasibility and applicability of the treatment as part of their evaluation process.

- ISPM No. 42 *Requirements for the use of Temperature Treatment as Phytosanitary Measures* (ISPM42) (25_IFQRG-15_2018_ISPM_42) was just adopted and might be useful in the discussion on heat treatment.

The group also discussed the need to look deeply into the implementation of ISPM 15 rather than issues with the standard itself. Some history was provided on how ISPM 15 was developed rather fast to respond to a pressing issue but data still needs to be gathered for Heat Treatment (HT) and Methyl bromide (MB), HT being more pressing since MB is mostly being phased out.

It was noted that equipment manufacturers should be clearly informed of the targets and treatment needs so they can produce equipment that responds to this need on the international level. Feasibility should be also taken in consideration when manufacturing new equipment.

The group then questioned the lack of submissions of treatments related to irradiation of wood products, using accelerated beam electrons or Gamma Rays, despite the availability of data and the fact that such treatments are being used around the world e.g. Gamma Rays to treat wood for furniture. The group recognizes the human hazard concerns related to the use of ionizing radiation but the submission of such treatment gives more options for countries to choose from, each according to their capacity and concerns. TPPT encouraged more submissions.

- There is a Phytosanitary Treatments Online Search Tool (<https://www.ippc.int/en/core-activities/standards-setting/technical-panels/technical-panel-phytosanitary-treatments/phytosanitary-treatments-tool/>) available on the IPPC website that would benefit from more frequent use by countries.
- TPPT is currently collaborating with the Phytosanitary Measures Research Group (PMRG) to develop research guidelines for the development of phytosanitary treatments, the most advanced of which is the one on HT.

Updates from TPFQ covered the inclusion of the sulfuryl fluoride fumigation of wood packaging material into ISPM 15 and the revision of the dielectric heating section of ISPM 15 have been finalized and adopted by CPM-13 in 2018 and that the revision of ISPM 15 on criteria for treatments for wood packaging material in international trade (2006-010) is still under development, pending the publication of the research done by IFQRG.

On the use of systems approaches in managing risks associated with the movement of wood commodities, the specification had gone through country consultations and is on the agenda for the November SC meeting. At this point it is still unclear whether it will be a stand-alone standard or an annex to the standard.

Action items that IFQRG is encouraged to undertake:

- *Complete the DH guidance manual*
- *Publish the data related to criteria for treatments of wood packaging material*
- *encourage more submissions to the open call*
- *Address the data gap of heat treatment for wood chips*

These items were discussed during the meeting with subsequent actions recorded as appropriate.



8.2 Update from the Implementation and Facilitation Unit of the IPPC Secretariat (including Guides and Training material)

13_IFQRG-15_2018

An overview was provided of the IPPC tools to evaluate gaps in implementation: Phytosanitary Capacity Evaluation (PCE) and Implementation Review and Support System (IRSS) including IRSS general surveys that are run once every 2 years and topic-specific surveys. Once gaps are identified, Implementation and Facilitation Unit (IFU) provides capacity development in the form of training material, e-learning, guides, and workshops. Information were also provided on the development of the IPPC guides and training materials including the Strategy and procedures. All materials are globally available on the IPPC portal in several languages. IFU also emphasized the need to have good baseline data to be able to assess whether a guide, training material, or treatment was successful.

Discussion:

A clarification was made on the difference between explanatory documents and guides that have different status and are considered IPPC resources. In addition, any available guide can be submitted to the IPPC Secretariat to be part of contributed resources, which are also accessible to all but not officially adopted by IPPC.

FAO would be interested in evaluating the quality of the contributed resources such as guides from different countries, but currently does not have the funding to hire experts for this purpose.

8.3 Update from FAO Forestry - Forest Health and Protection Activities for 2018

14_IFQRG-15_2018

An overview of the activities of FAO Forestry department was provided, including the work on regional forest invasive species networks, for which FAO plays a coordination and capacity development role, to increase the level of preparedness, management and monitoring. The networks' aims are mostly to share expertise and knowledge. FAO has prepared several e-learning courses and Train-the-Trainer programs which were used in workshops across countries.

FAO is also currently preparing a guide for classical biological control of insect pests in natural and planted forests to be published this year. The guide for implementation of phytosanitary standards is planning to be updated by next year.

9. Highlights of other meetings and surveys

9.1 Implementation of ISPM 15 in Developing Countries -STDF Report

26_IFQRG-15_2018

The presentation provided responded to Action Item A8 from IFQRG-14 Report.

The study done under STDF/460 on HT, MB and DH was implemented in Botswana, Cameroon, Kenya and Mozambique; collecting data from wood packaging material treatment facilities and some macro data on trade flows.

Main results included:

- Lack of knowledge of ISPM15 among system implementers
- Lack of traceability (stamps are not customized)



- Confusion about treatments e.g. using a treatment not provided in ISPM 15
- Common misunderstanding that the treatment has a validity date of just 3 months
- Some companies that lost their license were still exporting
- Recycling includes a mix of treated and untreated WPM and is very common
- Issues with thermocouple placement
- MB applied using tarp with holes and with no dosage tracking through time
- Lack and sometimes absence of communication between the NPPO and the treating facility
- Mixing treatment type and treatment requirements (ex. DH with a requirement of HT 56/30)
- HT stamp used across several treatment types.

Discussion:

The group discussed the issues mentioned above and ways to solve implementation issues in Africa.

Suggestions included:

- Having a rigid system and a way to enforce proper implementation through trade agreements or through international groups such as the International Cargo Cooperative Biosecurity Arrangement that can accredit and monitor facilities on behalf of the NPPO.
- Developing guides on how to approve facilities and apply standards with a clear simple checklist (members were encouraged to seek funding for IPPC to support the development of such guides and checklists).
- IFQRG needs to communicate to the CPM that implementation and compliance to standards are key
- NPPOs need to communicate closely and recurrently with their treating facilities to ensure proper implementation
- IFU explained that there is a standard on authorizing entities currently in consultations.
- There are several related resources in Canada, the US, European Plant Protection Organisation (EPPO), and other places that can be gathered and IFQRG can help select the best ones to be placed as contributed resources
- EPPO might be able to organize a regional workshop on this topic next year
- Need for an implementation capacity building committee that works on educational material both for implementers and NPPO teams, including easy material such as step-by-step illustrated procedures, guides with photos and graphs, checklists and short videos.
- Focus on training trainers instead of training workers
- Conduct a baseline survey before starting further education on this to be able to measure the improvement later.

Action item 05: Develop guides on how to approve facilities and apply standards with a clear simple checklist.



Action item 06: IFQRG to communicate to the CPM that implementation and compliance to standards are key (SSC)

9.2 IFQRG Strategic Research Survey

10_IFQRG-15_2018
11_IFQRG-15_2018
17_IFQRG-15_2018
41_IFQRG-15_2018

The preliminary results of the survey conducted on IFQRG strategic research areas were presented. The survey was developed to identify areas of focus in forest quarantine for future collaborative research projects for IFQRG members.

The preliminary results of the survey are available in 17_IFQRG-15_2018 and 11_IFQRG-15_2018.

Discussion:

Overall, the number of full responses received was not as high as anticipated. The group discussed mostly the need to get more people, especially from developing countries, to answer all of the survey. Since the survey itself is still open, the agreement was that there will be personal contacts from specific IFQRG members to RPPOs and NPPOs, industry and other relevant stakeholders to try to get more responses. The new deadline for closing the survey is December 1, 2018.

The data set available does not allow for major analyses in terms of region or organisation, hence a bigger data set would be more desirable. Another challenge faced with the survey is that answers are mostly short and not always clear.

It was suggested that the survey could be taken in hard copies to people during meetings and workshops to get more answers. It was also mentioned that the survey is complicated for non-English speaking countries and that simplifying it might encourage more people to take it. The concern on this was to find a way to simplify without affecting the potential for data compilation.

Concerning the drawing of research priorities from the results, the group discussed the need for the working group on the survey to summarize the data to enable the SSC of IFQRG to then comment and decide on priorities. Priorities could be taken in batches of 3-4 priorities for every cycle, similar to the International Union of Forestry Research Officers (IUFRO) special topic cycles. Periodic research meetings could be scheduled to discuss those topics and gather research around them. Funding for some meetings could be requested from Organisation for Economic Co-operation and Development (OECD) or similar organizations.

The group also discussed the need to engage new members. Such engagement was achieved when the meeting was taking place in different countries. However, the challenge has been to get people to stay engaged in following meetings, with funding identified as the main reason. Trying to find potential sources of funding, or setting up more international collaborations that engage new countries and diversifying the research portfolio might help improve engagement of new members.

Action item 07: Resend a second reminder about the survey to the IPPC list (SSC)

Action item 08: Contact NPPOs directly to invite comment (Mack to Far East; Howard and Veljkovic to Latin America and Asia-Pacific; Gething to industry groups)

Action item 09: Develop survey results into a paper with a glossary of acronyms, circulate to working group for review and to IFQRG members for comments, then publish it as a short review paper and submit it to CPM in April 2019. (Pawson, SSC)



10. Current phytosanitary issues

10.1 Regional Plant Protection Organizations

10.1.1 APPPC/NAPPO

Very little has occurred in the Asia Pacific Plant Protection Commission (APPPC) region related to forest quarantine. The region is looking to develop regional commodity standards that may include one on the international trade of logs.

North American Plant Protection Organization (NAPPO) has been working on systems approaches in forest quarantine.

10.1.2 EPPO

48_IFQRG-15_2018

Updates on the latest EPPO elections and activities were provided.

EPPO is currently working on:

- PM8 standards: Commodity-specific phytosanitary measures: includes recommendations not originally in the standards. Measures are selected from conducted pest risk analysis. Occasional pests are dealt with on a case-by-case basis and are taken in consideration according to their impact.
- PM3 Standard: 1) Inspection of Chips & 2) Sentinel Woody Plants. Currently under consideration by the Forestry Panel, and ready for country consultations.
- PM9 Standard: National Regulatory Control System for *Heterobasidium irregulare* – pest introduced to Italy from USA infecting pine trees. Also ready for country consultations.
- PM9/1 Standard: National Regulatory Control System for Pine wood nematode (*Bursaphelenchus xylophilus*): fifth revision in 2017- approved by the EPPO Working Party on Phytosanitary Regulations.
- Current study on “Bark and Ambrosia beetles on non-coniferous wood” undertaken to identify horizontal measures for such commodities.
- New standard on the assessment of biological control agents adopted by EPPO. With this EPPO will use a new decision-support scheme for the release of biological control agents. This will be soon published on the EPPO website and bulletin. (Andrei also clarified that this included only biological control agents that are successful, commercially available in at least 5 EPPO countries for at least 5 years with no negative impact; and not other beneficial insects).

The group was introduced to EUPHRESKO, a network for phytosanitary research coordination and funding, hosted within EPPO. Members were encouraged to check it and explore potential collaborations.

EPPO is also preparing a workshop in Serbia at the end of November on “Contingency Planning Exercise for Forest Pests”.



On the definition of sentinel woody plants, EPPO considers non-native trees planted in botanical gardens or parks or specifically planted as sentinel trees, as well as EU-native trees planted in native range of pests, ex. China, to see which pests could potentially infest them.

The group also discussed the challenges of shipping biological control agents across borders.

10.3 IFQRG's role and activities for the International Year of Plant Health (2020) 42_IFQRG-15_2018

There is a resolution by IPPC to have the UN General Assembly declare 2020 the International Year of Plant Health (IYPH), to promote plant health across the globe. This will include hosting events and media releases on issues related to plant health.

IPPC invited IFQRG members to think of ways to participate by promoting events, participating in planning, financing activities and so on.

Online materials are available for reference and promotion.

Discussion:

- IFQRG should use this opportunity to be part of the programming and increase IFQRGs visibility as well.
- Option to have another an International ISPM 15 implementation workshop/symposium

Action Item 10: IFQRG members will discuss how to be involved in programming for IYPH in the IFQRG-16 meeting and what media/promotional material can be put together. Working group composed of: Dawson, Gething, Verdasco, Orlinski, Ormsby, Noseworthy, Zhangjing and Nehme.

Action item 11: Gething and Verdasco to communicate to industry to see how the wood packaging industry can promote IYPH and IFQRG.

11. Development and implementation of standards

11.1 Systems Approaches in Forestry - Research and Implementation

15_IFQRG-15_2018
16_IFQRG-15_2018
52_IFQRG-15_2018

The North American Plant Protection Organization (NAPPO) Regional Standard for Phytosanitary Measures (RSPM) 41: *The use of systems approaches to mitigate pest risks associated with the movement of forest products* and appended explanatory document as well as the new draft Specification for an ISPM on the use of systems approaches for wood commodities are creating more environmentally sound options for the phytosanitary trade of wood products internationally. Next steps require scientific expertise on how to logistically verify and quantify realistic systems approaches. The concept of the forest products systems approach (FPSA) which is submitted under RSPM41 to be approved this October, was presented to the group. After introducing the concept and a few examples, the members divided themselves into 3 working groups, each discussing one of the following questions:

1. *Identify potential operational and technical implementation issues with FPSA?*
2. *What are the potential issues in your region or industry?*



3. *What verification processes would you recommend for different measures?*

Group reports on each of the questions came as follow:

1. Operational and Technical Implementation Issues include:
 - a. Ability to define chain of custody
 - b. Initiation of bilateral agreements and the need to have an agreement for each product, which requires a certain level of verification and trust btw NPPOs.
 - c. Specificity of the product: might not be easy to translate one system approach from one product to another.
 - d. Higher cost of implementation
 - e. Requires refinement of code classification. For ex wood chips, softwood vs hardwood
 - f. Key knowledge gaps that need to be addressed through more research

The first working group considered that there is a necessity for FPSA and that none of these challenges cannot be overcome. Only need to be specific to each product and each country.

Discussion:

- The chain of custody is a main issue and it should be set up in the forestry value chain. Competition between companies could stand in the way of sharing the chain of custody documents. A suggestion was made that this can be overcome through the NPPO to get the documents without sharing them with competing companies.
 - Bilateral agreements should include guidance on record keeping and documentation, which should be built into the SA.
 - FPSA could create incentives for phytosanitary compliance at the early stages of the chain, i.e. for producers to produce pest free wood- such incentives are currently lacking since treatment is mandatory.
 - There are existing examples of certification of pest-free areas as well as examples of traceability in mills through barcoding in Canada.
 - FPSA provides alternatives to reduce pest risk through a variety of approaches.
 - FPSA presents a certain level of flexibility. Bilateral agreements are developed based on 2-parties input and could be applied to a group of pests.
 - Under a FPSA, it is not necessary to have an intervention at every stage of the chain – need enough to meet the requirements of the importer.
2. Potential issues in your region and industry:
 - a. The process should start with the NPPOs and regulations and reg. enforcement measures should be in place before implementation
 - b. FPSA requires communication and collaboration
 - c. Need buy-in for appropriate surveillance
 - d. Preharvest monitoring varies between places



- e. Abiotic conditions could get in the way of applying harvesting standards as prescribed in FPSA. Ex. Harvesting in winter might be hindered by freezing leading to limited access to areas and limited truck loading capacity
- f. How to deal with large number of pest issues
- g. Additional potential pathways/re-infestation routes should be taken in consideration: culled logs, storage location, timing of loading for transport, contact with solid ground, post-transport storage, etc. This requires good knowledge of the biology of the pests. Need also to know hitchhikers.

Discussion:

- There should be inspection on every stage of the process
 - Segregation to get rid of culled logs, and disposing bark after de-barking and similar measures should be included in the regulations and bilateral agreements
 - There should be a clear separation between system approaches for pests coming from trees versus hitchhikers.
 - Systems approach should deal with post-harvest in some aspects such as time limitation to reduce the risk of potential post-harvest infestations, and pests that can re-infest post-harvest.
 - Hitchhikers will be discussed at the next NAPPO meeting.
3. Verification processes:
- a. Verification processes are definitely possible
 - b. Need more clarity on what is being verified? Commodity/host/pest
 - c. NPPOs should endorse/certify/control the process
 - d. Proper traceability is key
 - e. Need to take in consideration training in identification, auditing and additional costs for the companies.
 - f. Verification process should be outlined in the production manual
 - g. NPPO/assigned verification body should approve the process

Discussion:

- Suggestion to use critical control points instead of controlling every step of the process, and follow some standard principles such as HACCP.
- There should be traceability, proper inspection, and proper certification to ensure that the importing country has confidence that the product received has gone through a rigorous process.
- Molecular /isotopic study tools could be used to improve traceability.
- Need to ensure that the process is verifiable- transfer the lab results into industrial practical tools (example provided on the 2.5cm removal requirement that is not practically verifiable).
- Question around science needed to prove efficacy (how do we show the time validity of treatments for pest free areas?)



As a summary, the IFQRG group supports further research on the systems approach.

Action Item 12: Develop a list of key research needs for IFQRG to consider and share it in the work area (Noseworthy).

11.2 Dielectric Heating and Implementation

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(Note that 12.3.3 and 12.3.4 presentations took place right before this item)

The discussion was launched on dielectric heating by providing a background on DH, which started with the ISPM15 adopted in 2013 almost solely based on MW data. With time, MW was found to be less practical on the commercial level due to the cost of equipment and power involved and low depth of penetration. Instead, RF was proving to be commercially more viable. Meanwhile, China filed a petition with IPPC on DH implementation.

The discussion was mostly around how to best implement RF internationally and how to communicate broadly the technology.

The group believed in the efficacy and benefits of the technology to meet the standards. Further adjustments can achieve better homogeneity on the temperature and moisture levels. For industry, RF presents the perspective of saving time and money.

However, adopting RF universally needs to start by educating NPPOs and training facility workers, which may require a group of experts to train trainers.

Communication could be done through the IFAO industry advisory group, country-specific groups usually liaising between government and industry such as CWPCA in Canada, industry associated with NAPPO and others. IFQRG could even present this technology in regional and global workshops, and maybe to the CPM.

The advantage is that RF can be applied on different types of wood commodities and not just SWPM, which reduced substantially the current waste of energy and time experienced when treating small-size material. The capital cost is recognized to be a potential hindering factor for some countries, but is expected to decrease when more units are produced.

Providing solid economic data for industry encourages faster adoption. Getting some country-level approvals also helps push the process forward. For ex. Canada approved the technology but is currently waiting for offers from manufacturing companies.

There is a clear need for guidance material that clearly explains the use of DH to meet the standards.

Action item 13: Develop guidance documents for DH (Hoover, Uzunovic, Ormsby, Janowiak, Mack, Gething)

Action item 14: Work with China to resolve their objection to DH in ISPM28 (Mack, Janowiak, TPPT)

The working group covered mostly during the week general ideas on the guidelines, such as that the package would include in addition to the manual, e-learning material, videos and workshops. Both HT and DH guidance can follow the same outline and be produced as a series of guidance material with similar identity and composition for greater impact and to leverage more partnerships. Potential source of funding for publication includes the Pallet Foundation. An outline of the DH manual should be ready by mid-October. All manuals are advised to have simple language to make it easier to understand for non-native English speakers.



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11.3 ISPM 15 Heat Treatment Facility Guidance

The working group reported back on the outline of the HT manual:

Preamble on the aim and content of ISPM15 and advantages for the developing countries in terms of market access, compliance with importing countries requirements; explaining that additional cost is only around 10% (to clarify the cost-related fears).

The manual is targeted for NPPOs not for operators.

The manual would start then with a flowchart starting with NPPOs supplementing their plant protection law to enable oversight and register their mark, registering treatment providers and WPM producers, then audit them.

The manual would provide content of audit (documentary, workflow, marking, technical audit) and explains that the audit could be done directly by the NPPO or by a third party and explain what needs to happen in each case, what type of agreements to have with the third party, Standard Operating Procedures and NPPO audit and reporting requirements over the third party.

The manual will also tackle criteria of third-party auditor (still ongoing discussion). Some of the main criteria include being independent, with no conflict of interest, and with specific knowledge and background to enforce ISPM15.

On verification of Kiln, the working group developed a checklist and are looking for available documents related to this. The NPPOs should inspect the kiln, its condition (current and compared to initial approved condition), kind of material to be treated, cold spots in chamber, if sensors are located in the right place, the type of sensors used and verification/calibration of sensors; checking if the heat register is working properly, checking airflow, record keeping, and tracking volumes.

On the mark, the manual would cover topics such as: when to apply the mark? Kind of marks and format, examples of good/bad marks, information explaining what the mark represents and consequences for WPM producers in case of non-compliance, registration number and register accessibility to NPPO.

Discussion:

- Give guidance to look for the critical points/timing of audits
- ISPM 42 states: *‘Continuous supervision of treatments should not be necessary provided that there is a system for continuous temperature monitoring and for ensuring the security of the facility, process and the commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.’*
- Caution to ensure that the guidance documents developed align with the ISPMs
- Clarifying that the NPPO of the exporting country is responsible for non-compliance
- Consider licensing vs registering
- Kiln vs. HT



Action item 15: Develop HT manual content (Schroeder, Noseworthy, Dentelbeck, Krestchman, Veljkovic, Uzunovic, Gething, Tasciotti)

11.3.1 Heat Treatment Facility Simplification - Canada

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The Canadian Lumber Standards Accreditation Board (CLSAB) is the official body that monitors the quality of Canada's lumber and identification system, ensures building code compliance and has a contract with the Canadian Food Inspection Agency (CFIA) to oversee some certification programs including HT.

With this role, CLSAB audits treating facilities and trains inspectors regularly and are themselves audited by CFIA.

HT is part of the Kiln drying process and it is hard to sell wood that is not Kiln dried. Wood moisture content could vary largely by season, type of wood, temperature, etc.

Industry standards for hardwood vary between 6-8% unless it is shipped to drier areas where the standard goes down to as low as 4-6%. Reaching this low level of moisture might take more than 2 months in a kiln.

The position of the government of Canada is to use alternative service delivery (ASD) for inspection.

11.3.2 American Lumber Standards Committee's Role in US Heat Treatment for Packaging

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The American Lumber Standards Committee (ALSC) supports the United States Department of Agriculture- Animal and Plant Health Inspection (USDA-APHIS) in ensuring compliance of treating facilities. Their role is similar to CLSAB in Canada. ALSC audits and trains treating facilities and is itself audited by USDA-APHIS. ALSC communicate manuals developed by the agency to treating facilities which are usually simple bulleted manuals.

Both presentations (43_IFQRG-15_2018 and 46_IFQRG-15_2018) indicated very good efficacy results in terms of the treatment itself.

11.4. Forest Pathogens transfer via wood products

Historically there has been a focus on insects and nematodes in phytosanitary regulation with recent increased interest and concerns related to pathogens. Plants for planting is recognised as a pathway for pathogens but little is known about the potential of pathogens associated with forest commodities to transfer pathogens of concern. Following the action item from IFQRG 2017 meeting, a working group was formed to prepare a concept paper to address potential transfer of pathogens via wood products with a focus on round wood, sawn wood and wood chips. After several iterations done over conference calls in last year the most recent concept was presented during this meeting. The study suggests/hypothesizes that of the estimated 3.8 million fungal and oomycete species known globally, approximately 8,000 are considered detrimental to plants and approximately 300 are specifically tree pathogens. A small proportion of the known tree pathogens are found on forest products (round wood, sawn wood and wood chips) and in addition only a few such as *Heterobasidion annosum*, have an asexual stage that results in a potential pathway out of the wood.



To initiate consensus, a literature review was conducted of those that appeared to transfer via wood products and the key attributes that make them potentially successful. A Ranking process was initiated based on Genus level and subgroups of those genera that have majority of saprophytic species and a few that are pathogens to capture in a scientific way the rank to determine which few are of most concern versus majority of others that are of no concern.

Discussion points:

- Pathogens are not necessarily an issue in sawn timber/lumber;
- Some members thought that this paper could serve as a reference for regulators and NPPOs when faced with related questions. However, prior to publication, the paper and tables should be redesigned to avoid misinterpretations/misuse.
- The paper should not propose measures but be a scientific support for answers and decisions.
- Members cautioned to ensure that the wording of the document is well thought as to avoid more negativity around WPM as potential carriers of pests.
- Suggestion also to include the species and not genus to avoid confusions and generalizations.

Action item 16: IFQRG working group to continue working on the pathogens paper (Uzunovic, Eric Allen, Noseworthy, Veljkovic, Howard, Ormsby)

12. Research reports

12.1 Pest epidemiology

12.1.1 Spotted Lanternfly

44_IFQRG-15_2018

The spotted lanternfly (SLF) is a new invasive pest in the US that was first reported in 2014, believed to be introduced in 2012 hitchhiking on stone imported for landscaping in Berks County, PA. SLF has been reported to feed on about 70 different host species in 20 different families, with a strong preference for *Ailanthus altissima*, which is an invasive plant in N. America. In S. Korea and Pennsylvania, SLF is a serious pest of cultivated grapes (*Vitis* sp.) and numerous woody ornamentals/forest tree species such as *Acer rubrum* and *A. saccharinum*, *Salix* spp., *Juglans nigra*, *Prunus serotina*, *Platanus occidentalis*, wild *Vitis* spp., hops and apples. Economic impacts on grapes have been documented in S. Korea and data on yield losses from grape growers in Pennsylvania is beginning to be collected.

Current research is showing that it can develop to adult on species other than *Ailanthus altissima*. Whether it can reproduce on other species is not yet known.

Of particular concern is extensive sooty mold covering regenerative growth in forests, which can block photosynthesis.

Egg masses of SLF are cryptic, appearing like a smear of mud, and the females will lay eggs on not just host trees, but any smooth surface, including vehicles, railroad cars, smooth rusting metal, sawlogs, wood packaging materials, telephone poles, etc. Thus, numerous human-mediated pathways represent high risk in areas infested with SLF.

The Pennsylvania Department of Agriculture's Hardwoods Development Council recently developed best management practices (BMPs) to reduce the risk of movement of spotted lanternfly out of the 13



quarantined counties in PA. These BMPs apply to companies, sawmills, loggers, kiln operators, truckers, etc. A topic of concern is what this pest is costing the timber and forest products industries to comply with BMPs and quarantine restrictions.

Discussion:

The discussion focused on the need to have a strong eradication program and to act fast once an introduction is detected. Education of peoples at ports of entry is key to help them identify the egg masses, which are more likely to be found between May and September.

Eggs have diapause period and diapausing eggs are tolerant to fumigation.

Classical biological control studies are ongoing. There are egg and nymphal parasitoids identified in the native range.

12.1.2 Alternative to Probit 9

31_IFQRG-15_2018

Presentation on Calculating Treatment Efficacy Against Invasive Alien Species in Trade:

IFQRG has been asked by IPPC to evaluate more suitable levels of efficacy for treatments on wood packaging material moving in international trade. Back in 1939, Probit 9 was established as the default level of efficacy for treatments applied in international trade. However, this level has been challenged later by several for reasons related to feasibility, risk management and cost efficiency. The study developed provides a simpler and less demanding method to test efficacy. The model/equation takes in consideration aggregation size of host, worst-case infestation levels and the maximum pest limit required to establish a population. The approach is based on the biological system pathway concept predicting that insect populations decrease as we move long the life stages and what really matters is the number of survivors at the mature adult stage where establishment can happen. In Ormsby and Chase (paper to be submitted) on “Elucidating the efficacy of phytosanitary measures for invasive alien species moving in wood packaging material”, the authors were able to define number of individuals to be tested and the target efficacy level for 7 groups, including 5 insect families, fungi and nematodes. The idea is that a small sample size of around 60 individuals of any species within each of those groups would be tested to identify the most tolerant species and the most tolerant life stage. Then, that latter would be tested to the designated sample test size. This method is a much more feasible compared to Probit 9 and is equally effective at preventing invasive forestry pests moving in the international trade of wood packaging material.

Discussion:

Clarification that the data is calculated based on lab survival data, which is more conservative than field data. Members agreed that this limits the number of species to be tested to 7 and limits the number of individuals needed for the tests. There were still standing concerns about the high number of cerambycids to be tested. Numbers could be refined if more life table data for insects were available.

There was also a concern than pathogens might end up being the most tolerant species while they're the least relevant pests on wood in international trade and might lead to over-treatment. However, there are existing examples such as *Heterobasidion* sp. that are international trade wood pests to be taken in consideration.

The relatively low number of scolytids requested for the test is related to the fact that scolytids were found to be harder to establish.



There was a suggestion to test it on Pine Wood Nematode (*Bursaphelenchus xylophilus*) (PWN) since it is the most tolerant from the HT perspective.

IFQRG partially endorsed the paper and supported the submission of the paper to a journal with the hope that it would generate more discussion and further science around the topic.

Action item 17: Submit the paper to a refereed journal (Ormsby)

12.2 Pest detection

36_IFQRG-15_2018
37_IFQRG-15_2018

12.2.1 Diversity of insects and fungi in traded tree seeds

The work on the detection and identification of unknown harmful organisms for regulation through sentinel plantings was presented. The process includes planting European native trees in countries where potential pests could be coming from or surveying few established trees in botanic gardens and young trees in plantations. This requires a good level of collaboration and reciprocity among countries.

COST Action “Global Warning” aims at establishing a global network of scientists to work together on sentinel nurseries, create a list of vulnerable tree species, suggest common protocols for monitoring and identification of pests and explore regulatory implications with NPPOs. Currently there are 45 countries participating in COST, which is finishing in December 2018

The field guide for the identification of damage on woody sentinel plants is now available in hard and electronic copies (www.cabi.org/cabebooks).

Discussion:

Questions that IFQRG could help answer regarding the movement of forestry plants for planting include:

- What phytosanitary treatments for live plants (P4P) exist?
- How effective are these treatments against different organism groups?

A second presentation was provided on seed pathogens.

Seeds are considered relatively safe from the phytosanitary point of view. The first step of the study aimed at knowing the baseline of what was being moved with the seeds and what was recruited in the planting location. Seeds were bought from 3 continents: North America, Asia and Europe.

One hundred seeds were X-rayed from each seed lot. Seeds containing insects were dissected and identification done to the family level for most and to the species level for some. Fungi were also isolated and fungal barcoding was conducted on ground seeds.

Number of insects found in seeds were much lower than fungi. All insects were found in conifer species but none in pines (on *Larix*, *Tsuga* and *Picea* spp.). Only samples from North America had seeds inside the angiosperms, which were coleopteran and lepidopteran. In general, five insect orders were found in the seeds. Most of the specimen were chalcid wasps, which are the most abundant species on seeds in general.

Angiosperms had more fungi than gymnosperms. 1258 operational taxonomic units (OTUs) were found from 237 genera. The majority of OTUs come from angiosperms and few are common to both. Out of



all species found, 15 are not previously recorded in Europe and 8 with limited distribution, all identified with Next Generation Sequencing (NGS), with only one detected with plating.

The study shows evidence that some of those fungal pathogens were found to be moved to countries where they weren't reported before. None of these pathogens are regulated quarantine pests. The only one listed in the EPPO list is *Sirococcus tsugae*.

Another current study on Global Patterns in pests on selected tree genera is being conducted on live plants often traded in their dormant stage. The study assesses global biodiversity patterns of pests associated with dormant tissues and the likelihoods of host shifts. First results show difference in different genera in fungal morphotypes.

Discussion:

- Genetic-based diagnostic tools for pest detection is a topic that is being discussed by the Technical Panel for Diagnostic Protocols (TPDP). A CPM recommendation is being developed on the use of NGS technology.
- Caution was raised of how data is taken and interpreted on the regulatory level.
- Data based on NGS technology do not reveal whether identified org are dead or not.
- Question whether IFQRG should be more involved in NGS?

12.2.2 ISPM 15 - Industrial perspective

28_IFQRG-15_2018
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The industry's perspective about ISPM 15 and the importance of IFQRG's work from the industry's perspective were communicated to meeting participants.

While the ISPM 15 program has effectively mitigated the spread of pests carried by wood packaging material, questions have been raised if this level of effectiveness is sufficient. Industry continues to explore opportunities and seek partnerships to further improve compliance and enhance safe trade facilitated by WPM.

The industry can play a role in supporting, outreach and education, policy and research. Recently, a new Global Wood Packaging Forum was established, which grouped in its first meeting 14 countries.

The Pallet Foundation is raising \$300K/year, some of which is already earmarked while some can be used to support research related to ISPM15.

Discussion:

- Since ISPM 15's full implementation in 2006, Canada has had a few introductions that are more likely to have been introduced on plants for planting while there were no notable pests in WPM. Same applied to USA. EPPO confirmed that WPM is becoming less of an issue.
- EPPO (Germany) is dealing with issues with missing or illegible marks.
- Requests to raise awareness during IYPH on the important of ensuring WPM is marked.
- There are still some reported outbreaks of Asian Longhorn Beetle (*Anoplophora glabripennis*) in Europe but accurate data is not available for all.



- IFQRG members considered that P4P represents a higher risk of quarantine pest movement than WPM thanks to the effective implementation of ISPM15.

12.2.3 Possible Introduction of Quarantine Pests with Wood Packaging Materials 51_IFQRG-15_2018

Data on interception of pests from WPM in Russia coming from different parts of the world were shared with the participants.

The discussion focused on the need for NPPOs to communicate such interception information among them and for the industry, as required by IPPC and that there should be close coordination between inspection agencies and NPPOs to ensure clear communication of data to be able to track the reasons behind the interceptions (i.e. treatment failure, implementation issues, fraud, or other cases).

Other packaging material might also transfer pests and should be looked for as well.

12.3 Wood treatments

12.3.1 HT of EAB infested wood update

Natural Resources Canada - Canadian Forest Service are working on several trials driven by the lack of data that supports precise heat treatment schedules causing insect mortality, or sub-lethal temperatures' effect on viability, longevity, and fecundity of pests. Emerald Ash Borer (*Agrilus planipennis*) (EAB) was chosen as the test insect because of availability of high densities and heavily infested trees.

Infested mature ash trees were harvested from a heavily infested area during February. Logs were cut to 1m sections, milled into slabs with bark on, then transported in sealed containers to the FP Innovations lab. Thermocouples were placed in the center of the thickest portion of sapwood. Slabs with bark on were used to maximize the number of individuals. Slabs were then treated in kiln then placed in cool storage for the rest of the winter. In the spring, slabs were transported to Canadian Forest Service lab and reared. Emerging adults were sexed and mated to test for sub-lethal effects. Slabs were then dissected to determine existing un-emerged life stages and initial population per slab.

Insect population size did not differ across treatments. No clear evidence for sub-lethal effects. Data confirmed that ISPM15 HT 56/30 was enough to kill EAB life stages. Actual temperatures were higher than target temperatures. Data analysis is still ongoing. A paper will be published soon on this work.

Discussion:

- Need more specific data on what the insect is experiencing at temperature. At Penn State, they tried inserting super-fine probes within the insect bodies and temperatures were at least as hot as outside. However, it was hard to set the sensor correctly and they couldn't do enough replications.
- No moisture data was collected. Logs are kept cold which is supposed to preserve moisture.
- Suggestion to run the same tests with logs harvested in the summer to check whether heat tolerant proteins could affect the results.

12.3.2 Heat Treatment-Determining Specific Lethal Doses for Pests of Quarantine Concern

The experimental set-up, recently developed at Natural Resources Canada - Canadian Forest Service to help determine specific lethal doses for pests of quarantine concern was shown to IFQRG meeting



participants. The set-up is composed of a heat treatment system that can test up to 192 organisms at a time based on the biological size exposed to different temperatures by placing them in vials within a water bath. Exposure could be gradual or the vials can be submerged when the water bath reaches 56°C. Sensors connected to six data loggers allow real-time monitoring of temperatures.

Discussion:

This apparatus is promising to be a good tool to measure real-life temperature experienced by the insects and determine more accurately the lethal dose for each species and life stage. Could be used for eggs.

IFQRG members present at the time of the discussion agreed that this could be used in international collaboration projects to test pests in different countries and generate several sets of data concurrently.

12.3.3 Major Developments of Radio Frequency Technology for Treatment of Wood Packaging

A commercial-scale prototype model of a 50KW RF/pressurized chamber was developed at the Forest Resources Lab at PSU, in collaboration with USDA/APHIS/PPQ and Kiln Tech. Temperature and pressure data in different scenarios of wood sizes, placement, types and loads were presented.

The system has the ability to apply pressure of about 15 psi during heat treatment, which markedly improves heating uniformity and reduces treatment duration with less moisture loss from the wood than conventional RF or kiln heating.

Some of the findings of the experiments conducted show that heating constructed wood pallet components instead of cants, adjustments in power input, and timing of applied pressurization, all have major impacts on the efficiency of this technology. Enhancements to the treatment chamber helped in minimizing energy use and reduced treatment time for the workload without having to increase the power density to meet the treatment schedule of ISPM-15. As a result, significant savings in energy consumption and cost can be realized.

Discussion:

- There is an influence of the dimension of the wood on the time needed to reach the temperature (Decking boards are treated faster than stringers).
- No evidence of cell collapse
- There is ongoing work to improve temperature heating rates and uniformity further within the chamber
- Wax on wood (anchor seals) negatively affected ability to uniformly increase wood temperature
- When tested on logs, logs with bark on had more homogeneous temperatures than debarked ones. Applying wool insulation on debarked round wood improved heat development to sanitize critical sapwood zone material.
- Tested on blocks: potential for reducing the treatment time to 25-30min

12.3.4 Economics of Radio frequency (RF) for Treating WPM in Compliance with ISPM15

Radio frequency (RF) heating of wood fiber has demonstrated promising results for meeting ISPM 15 wood packaging phytosanitation protocols. Penn State University, with assistance from USDA ARS,



has fabricated a commercial scale (1200 bdf capacity) RF/pressurization treatment chamber. Currently WPM treatment schedules are being developed for various wooden pallet and dunnage components that are commonly used by pallet manufacturers. In concert with this research, the PSU team is also evaluating the economic and business case for pallet manufacturer adoption of RF/pressurization heat treating technology.

Specifically, the study is evaluating cycle time, energy use, and labor and operating conditions for heat treating cants, pallet stringers, blocks and deck boards. These data will inform operational analyses of incorporating technology with large, medium and small pallet manufacturers. RF technology value propositions are being developed for pallet manufacturers that consider treatment chamber design, operational integration, wood materials and charge configurations. Value proposition analysis is the detailed assessment of product or service features, benefits and costs for a specific user. The analysis being done will provide generalizable adoption economics and value propositions by large, medium and small pallet manufacturer type. Value propositions will be contrasted to conventional dry kiln, microwave and methyl bromide phytosanitary treatments. Initial analyses show significant promise for pallet manufacturer utilization of RF with pressurization for disinfestation of WPM in compliance with ISPM15.

Conclusion:

- IFQRG members present at the time of the discussion considered that the economics of DH compare favorably with conventional HT for WPM

12.3.5 Ethanedinitrile (C₂N₂) (EDN) research

An update was provided on current work on EDN in USA and Canada that is a continuation of research on alternatives to Methyl bromide (MBr), including Phosphine and Sulfuryl fluoride. It follows the methodology developed through a collaboration between USDA-APHIS and FP-Innovations using 10 litre jars with different doses of gas (presented in previous meetings) as well as the methodology of growing PWN in logs and small pieces of wood.

In 2017, the EDN test gas was provided to USDA and in late September 2018, to FP innovations. USDA tested EDN on small wood blocks infested with PWN and this year they are planning on testing it on logs and also on oak wilt. FP innovations is planning to test EDN against PWN in small logs and wood to understand mode of action of EDN in wood versus in overhead, and to test preliminary efficacy against four quarantine pathogens. Studies on penetration, sorption and off-gassing are ongoing at the University of Tennessee in collaboration with New Zealand.

Discussion:

- On the PWN inoculation method, IFQRG members suggested to try inoculating without infecting with fungus first since PWN has a pathogenic and a mycophagous stage, the first of which does not require the presence of the fungus to infest a new log. The effect of the presence of the fungus on the establishment of PWN is not yet known and fungi-infected wood is not the target category of wood in a trade context.
- Suggestion to do the study with one isolate to get specific results and shared from his experience that fresh PWN material has always worked better than older ones.
- On the EDN treatment, there has been a submission put forward by New Zealand but TPPT needs more information to support the treatment at this time. Missing information include a



better understanding of the mode of action and pharmacokinetics e.g. how it is transformed? What is happening inside the log? Is it being released again? How far does it penetrate? Would it be efficient for heartwood borers?

- Discussion on whether the cost of research is justifiable in terms of economic benefits at application stage of EDN.
- The advantage is that EDN is more environmentally-friendly than MBr.
- There are current studies on detecting EDN inside insect bodies without dissecting. Chemists believe that the transformation is happening quickly.
- Modeling can be another way to predict the level of efficacy that would reduce the need for extensive testing.
- Need to move processes of treatment submission faster without getting too stuck in the level of uncertainty.

12.3.6 EDN: A new fumigant for phytosanitary treatment of New Zealand export logs - update

The toxicity level of EDN was shown to be minimal and most of it is transformed so that very little is actually left inside the treatment chamber at the end of the 24hr treatment.

EDN was registered in Australia for sawn timber and logs, currently being investigated in New Zealand. Three forest insects found in association with New Zealand logs were tested for tolerance and the two most tolerant life stages were chosen for further studies. 28 L fumigation chambers were used with doses of 20 or 50 g/m³. Sorption was monitored by measuring concentration of EDN in chambers during the 10hr treatment, quantified through Gas Chromatography. Results showed that loading was mostly affecting EDN sorption while moisture content, dose and grain were not.

The New Zealand team are now at phase 2 of the research testing logs with 200 pupae each in 500 L chambers. One previously conducted commercial scale test matched the Australian rate for the treatment but no effective dose was defined for the target pests.

The end point concentration of EDN was only 11.2% of the initial one after 10hr treatment.

Discussion:

- Depth of penetration not determined
- Data is promising. Specific to Radiata pine.
- Members discussed the significance of the behavior of EDN within wood, which is not like that of other fumigants such as MBr.

Conclusion:

- IFQRG members present at the time of the discussion agreed that EDN is a promising alternative to MBr.



12.3.7. Toxicity of reduced MBr rates to selected insects associated with NZ export logs

On the MBr research plan, New Zealand are now at the large scale confirmation tests phase (phase 3), testing on 3 species and 11 life stages, and over 200,000 insects. They managed to develop a protocol for rearing insects in quantities to supply the needed numbers for the tests. They developed a log infestation method using 15 pairs of *Hylurgus ligniperda* (Golden-haired bark beetle) or *Hylastes ater* (Black pine bark beetle) (found to be the most tolerant) so they ended up with 200 individuals/log on average after 7 wks. First tests are done in 28 liter chambers while large scale tests are done in 500 liter chambers. Results showed that they could lower the dose by increasing the temperature and same temperature and dose was equally effective on both insects. Other data supports 60-70% reduction in MBr use.

Conclusion:

- IFQRG members present at the time of the discussion noted that research conducted in NZ supports the potential reduction of MBr treatment rates.

12.3.8 Joule Heating Method

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Joule heating method was proposed as an alternative phytosanitary treatment that can be applied to whole logs (*Radiata* pine). The study on Joule Heating acquired wood property data to properly model the heating development. A major challenge is that heartwood and sapwood have very different properties resulting in non-uniform heating (slow, cool in heartwood vs fast, hot in the sapwood). Knots were found to cause hot and cold spots and the solution was to inject heat or release energy into the log at a number of intervals.

The study found reasonable agreement between mathematical model and experimental temperature measurements post treatment. Further work is needed on refining model and process control. The pilot machine would be able to treat several logs in succession. This approach can be used on multiple wood species.

Discussion:

- Question about moisture loss being an issue because of how hot the sapwood gets. Moisture loss can be minimized by keeping the bark on (approximately 5%).
- Question about mechanical degradation from treatment, but post evaluation of the wood material showed that it does not occur when heat dissipation is carefully controlled.

This process was developed for *Pinus radiata* and pests in New Zealand (bark beetles in radiata pine) and has been shown to be successful.

Further development and information may be necessary to apply it to other pests, commodities and wood types.

Conclusion:

- IFQRG members present at the time of the discussion recognized that Joule Heating is capable of achieving the HT requirement as specified in ISPM15.



12.3.9 Vacuum and steam treatment

32_IFQRG-15_2018

Data were presented on vacuum and steam treatment, as well as the prototype used for those treatments. Vacuum and Steam has demonstrated to have quarantine efficacy against actionable cerambycids in processed bamboo. The advantages of this treatment is that it can be a good environmentally-friendly alternative for MBr fumigation, especially in places where MBr is being phased out. In addition, treatment time is reduced substantially with vacuum and steam compared to MBr or HT.

Discussion:

- Additional tests were run on high value logs such as oak for oak wilt and walnut for thousand canker disease
- The research team will try to speed up the process on the phytosanitary approvals and equipment engineering tracks to ensure a quicker commercial placement
- Currently USDA and Virginia Polytechnic Institute are exploring a CRADA (an official agreement between the USDA and another entity) for providing out a model system for Baltimore
- Other applications are under consideration including mulch and chips

Conclusion:

IFQRG members present at the time of the discussion considered Vacuum and Steam treatment to be a viable treatment for a number of durable commodities.

13. Review and adoption of IFQRG-14 report

05_IFQRG-15_2018

13.1 Research opportunities

- Life tables:
- Founder populations:
- Pest contaminants/hitchhikers on WPM and forest products:
- Collaboration on specific lethal dose heat treatment:

13.1.1 Industry science questions

- Interception vs establishment:
- Delineating the risk associated with different types of WPM:

13.2. Appointment of the Steering Committee

IFQRG Chair shared the list of IFQRG members nominated for the SSC in compliance with the IFQRG Rules of Procedures that included representation from five IPPC regions, and asked for feedback from meeting participants.

With no suggested additions or subtractions from the list of nominations, Meghan Noseworthy moved a motion to approve the listed IFQRG members as members of the SSC, and Brad Gething seconded.



All IFQRG members present at the time of the discussion approved the motion to appoint the following IFQRG members as members of the IFQRG Science Steering Committee (SSC), in no particular order:

- Dr. Eric Allen Canada (NAPPO)
- Dr. Kelli Hoover USA (NAPPO, PPPO)
- Ron Mack USA (NAPPO, PPPO)
- Dr. Maya Nehme Lebanon (NEPPO)
- Dr Andrei Orlinski EU (EPPO)
- Dr. Michael Ormsby New Zealand (APPPC, PPPO)
- Dr. Stephen Pawson New Zealand (APPPC, PPPO)
- Dr. Thomas Schroeder Germany (EPPO)
- Dr. Adnan Uzunovic Canada (NAPPO)

13.3. Work program for 2018-19

A01. Report on data on wood packaging storage patterns will be posted on IFQRG website.	<u>Ormsby</u>
A02: Establish process for regular intersessional updates on IFQRG actions.	SSC members
A03: IFQRG members are encouraged to check the IPPC web page (IPP) for information on what is available for input and provide comments via their IPPC official contact point	All members
A04: Post ToR and Rules of Procedures on the IFQRG webpage	SSC members
A05: Develop guides on how to approve facilities and apply standards with a clear simple checklist	All members
A06: IFQRG to communicate to the CPM that implementation and compliance to standards are key	SSC members
A07: Resend a second reminder about the IFQRG survey to the IPPC list to encourage participation.	SSC members
A08: Contact NPPOs directly about the IFQRG survey to encourage them to participate.	Mack to Far East; Howard and Veljkovic to Latin America and Asia-Pacific; Gething to industry groups
A09: Develop IFQRG survey results into a paper with a glossary of acronyms, circulate to working group for review and to IFQRG members for comments, then publish it as a short review paper and submit it to CPM in April 2019.	<u>Pawson</u> , SSC



A10: Discuss how to be involved in programming for IYPH in the IFQRG-16 meeting and what media/promotional material can be put together.	Dawson, Gething, Verdasco, Orlinski, Ormsby, Noseworthy, Zhangjing, Nehme.
A11: Communicate to industry to see how the wood packaging industry can promote IYPH and IFQRG	Gething, Verdasco
A12: Develop a list of key research needs on FPSA for IFQRG to consider and share it in the work area.	Noseworthy
A13: Develop guidance documents for DH	<u>Hoover</u> , Uzunovic, Ormsby, Janowiak, Mack, Gething
A14: Work with China to resolve their objection to DH in ISPM28	Mack, Janowiak, TPPT
A15: Develop HT guidance manual content	<u>Schröder</u> , Noseworthy, Dentelbeck, Krestchman, Veljkovic, Uzunovic, Gething, Tasciotti
A16: Continue to work on the paper on pathogens	<u>Uzunovic</u> , Eric Allen, Noseworthy, Veljkovic, Howard, Ormsby
A17: Submit paper on “Calculating Treatment Efficacy Against Invasive Alien Species in Trade” for publication	<u>Ormsby</u>

13.5 Date and location IFQRG-16 (2019)

The next meeting is expected to be right before or after the IUFRO meeting in Brazil. EPPO council will be meeting the week before IUFRO, hence a request from EPPO representatives to schedule the meeting the week after IUFRO.

In 2020, the meeting will take place again in Rome, on the last or second-to-last week of September.

14. Close of Meeting

IFQRG thanked the IPPC Secretariat for hosting the meeting and for organizing the lovely dinner on Wednesday night.

The Chair thanked the participants for their commitment and participation and encouraged them to follow up on their action items before the next meeting.

Appendix 1: List of Participants



Photo' N°	First name	Last name	Country	Email address
3	Marcel	Dawson	Canada	Marcel.Dawson@Canada.ca
9	Chuck	Dentelbeck	Canada	cdentelbeck@clsab.ca
Not in Photo	Rene	Eschen	Switzerland	r.eschen@cabi.org
Not in Photo	Iva	Franic	Switzerland	i.franic@cabi.org; iva.franic1@gmail.com
18	Ian	Gear	NZ	ian@ingearglobal.com; the.gears@xtra.co.nz
20	Brad	Getting	USA	bgetting@palletcentral.com
25	Demian	Gomez*	Italy	demiangz@gmail.com
1	Mark	Hamelin	Canada	mark@aquatimber.com
Not in Photo	Bill	Heffernan	UK	bill.heffernan@epecentre.ac.nz; bill.heffernan@inet.net.nz
21	Christopher	Howard	Australia	Chris.Howard@agriculture.gov.au; chrishoward@y7mail.com
12	Kelli	Hoover	USA	kxh25@psu.edu; kxhoover2015@gmail.com
14	John	Janowiak	USA	jjj2@psu.edu; johnpaul127@verizon.net
26	Janka	Kiss	Italy	janka.kiss@fao.org; kissjanka@yahoo.co.uk
5	Oleg	Kulinich	Russia	okulinich@mail.ru; okulinich1@gmail.com
7	David	Kretschmann	USA	dkretschmann@alsc.org; dekretschmann@gmail.com
8	Ketevan	Lomsadze	Italy	ketevan.lomsadze@fao.org



Photo' N°	First name	Last name	Country	Email address
23	Brent	Larson	Italy	brent.larson@fao.org; brent.larson@fao.org
2	Ron	Mack	USA	ron.mack@aphis.usda.gov
13	Maya	Nehme	Lebanon	maya.nehme@gmail.com; mnehme@lri-lb.org
19	Meghan	Noseworthy	Canada	meghan.noseworthy@canada.ca
6	Andrei	Orlinski	EU	orlinski@eppo.int; Orlinski@eppo.int
16	Michael	Ormsby	NZ	Michael.Ormsby@mpi.govt.nz
Not in Photo	Megan	Quinlan*	UK	m.quinlan@imperial.ac.uk; quinlanmm@aol.com
10	Shiroma	Sathyapala	Italy	Shiroma.Sathyapala@fao.org
24	Thomas	Schröder	Germany	Thomas.Schroeder@bmel.bund.de
22	Luca	Tasciotti	UK	lt20@soas.ac.uk; lt20@soas.ac.uk
17	Adnan	Uzunovic	Canada	adnan.uzunovic@fpinnovations.ca
Not in Photo	Paulo	Verdasca	Portugal	paulo.verdasca@madeca.pt; paulo.verdasca@gmail.com
15	Ivan	Veljkovic	NZ	Ivan.Veljkovic@mpi.govt.nz; ivveljko@yahoo.com
11	Brian	Zak	Canada	zak@allforestsolutions.com; brianzak48@gmail.com
4	Chen	Zhangjing	USA	chengo@vt.edu; chengo@vt.edu

*Observer



Appendix 2: List of Documents Tabled or Presented at IFQRG 15

Document Number	Agenda Item	Document Title
01_IFQRG-15_2018	6	Agenda
02_IFQRG-15_2018	4	IFQRG 15 First Announcement
03_IFQRG-15_2018	6.1	Abstracts
04_IFQRG-15_2018	3	Local Information
05_IFQRG-15_2018	7	Report IFQRG-14, 2018 (New Zealand)
06_IFQRG-15_2018	6.1	Documents List
07_IFQRG-15_2018	5	Participants List
08_IFQRG-15_2018	7.2	IFQRG Terms of Reference
09_IFQRG-15_2018	7.3	IFQRG Rules of Procedure
10_IFQRG-15_2018	9.2	IFQRG Strategy Survey
11_IFQRG-15_2018	9.2	IFQRG Strategy Survey Summary – free text and commentary
12_IFQRG-15_2018	8.1	Update from the Standard Setting Unit of the IPPC Secretariat (TPPT and TPFQ)
13_IFQRG-15_2018	8.2	Update from the Implementation and Facilitation Unit of the IPPC Secretariat
14_IFQRG-15_2018	8.3	FAO Forestry update
15_IFQRG-15_2018	11.1	RSPM 41- NAPPO Systems Approach Standard
16_IFQRG-15_2018	11.1	ISPM XX Draft Specification Use of systems approaches in managing the pest risks associated with the movement of wood commodities
17_IFQRG-15_2018	9.2	IFQRG Strategy Survey Summary – numerical answers
19_IFQRG-15_2018	11.2	ISPM Dielectric heating as a treatment for wood packaging material – quick guide
20_IFQRG-15_2018	12.3.8	Pawson <i>et al.</i> 2018 - Quantifying the thermal tolerance of wood borers and bark beetles
21_IFQRG-15_2018	12.3.8	Heffernan <i>et al.</i> 2018 – Joule heating of logs for phytosanitary purposes
22_IFQRG-15_2018	11.3	ISPM 15 – Regulation of wood packaging material in international trade
23_IFQRG-15_2018	11.3	Explanatory document for ISPM 15
24_IFQRG-15_2018	11.3	NAPPO Heat Treatment Science and Technology Doc
25_IFQRG-15_2018	11.3	ISPM 42 – Requirements for the use of temperature treatments as phytosanitary measures
26_IFQRG-15_2018	9.1	STDF Report on implementation of ISPM 15 in African countries



Document Number	Agenda Item	Document Title
27_IFQRG-15_2018	11.3.1	The Technical Heat Treatment Guidelines and Operating Conditions Manual CFIA
28_IFQRG-15_2018	12.2.2	Eyre <i>et al.</i> 2018 - Variation in Inspection Efficacy by Member States of Wood Packaging Material Entering the European Union
29_IFQRG-15_2018	12.2.2	Haack <i>et al.</i> 2014 – Effectiveness of the International Phytosanitary Standard ISPM No. 15 on Reducing Wood Borer Infestation Rates in Wood Packaging Material Entering the United States
30_IFQRG-15_2018	12.2.2	Lovett <i>et al.</i> 2016 – Nonnative forest insects and pathogens in the United States: Impacts and policy options
31_IFQRG-15_2018	12.1.2	Ormsby <i>et al.</i> (in press) - Elucidating the efficacy of phytosanitary measures for insect pests moving in wood packaging material
32_IFQRG-15_2018	12.3.9	Juzwik <i>et al.</i> 2018 - Vacuum steam treatment viable <i>Bretziella fagacearum</i> from logs cut from wilted <i>Quercus rubra</i>
33_IFQRG-15_2018	12.3.8	Joule Heating – Recommendations for Consideration – Gear
34_IFQRG-15_2018	12.3.7	MB – Recommendations for Consideration – Gear
35_IFQRG-15_2018	12.3.6	EDN - Recommendations for Consideration – Gear
36_IFQRG-15_2018	12.2	Roe <i>et al.</i> 2018 - Biosurveillance of forest insects Part I
37_IFQRG-15_2018	12.2	Bilodeau <i>et al.</i> 2018 - Biosurveillance of forest insects: part II
38_IFQRG-15_2018	11.3	ISPM 15 Heat treatment facility establishment and accreditation support
39_IFQRG-14_2018	11.2	Guidelines for the application and verification of dielectric heating as a phytosanitary measure Draft 2012
40_IFQRG-15_2018	5	Group photo of IFQRG participants, Rome, 2018
41_IFQRG-15_2018	9.2	PPT: IFQRG Strategy Survey – Steve Pawson
42_IFQRG-15_2018	10.3	PPT: International Year of Plant Health
43_IFQRG-15_2018	11.3.1	PPT: Kilns - Dentelbeck
44_IFQRG-15_2018	12.1.1	PPT: Spotted Lanternfly - Hoover
45_IFQRG-15_2018	12.3.9	PPT: Vacuum Steam HT - Chen
46_IFQRG-15_2018	11.3.2	PPT: Heat treatment in the US - Kretschman
47_IFQRG-15_2018	12.3.3	PPT: Developments in RF – Janowiak
48_IFQRG-15_2018	10.1.2	PPT: EPPO Report - Orlinski
49_IFQRG-15_2018	12.3.4	PPT: Commercial assessment of RF Treatment - Hoover
50_IFQRG-15_2018	11.3.2	PPT: HT-Verification - Schroeder
51_IRQRG-15_2018	11.4	PPT: ISPM15 pests - Kulinich
52_IFQRG-15_2018	11.1	PPT: Systems Approaches - Noseworthy



Appendix 3: IFQRG Terms of Reference

International Forestry Quarantine Research Group (IFQRG)

Terms of Reference

1. Mission

The mission of the International Forestry Quarantine Research Group (IFQRG) is to support and address critical forestry quarantine issues for the global plant health community through scientific analysis, discussion and collaborative research.

2. Membership

IFQRG's goal is for membership to include global representation from scientific, industrial and phytosanitary organizations from both developed and developing nations. Membership is open to suitably qualified individuals who have demonstrated expertise in disciplines relevant to plant health. IFQRG endeavours to recruit members from the all FAO regions.

3. Clients

A key client of the IFQRG is the Commission of Phytosanitary Measures (CPM), the governing body of the International Plant Protection Convention (IPPC), and its subsidiary bodies, as well as associated groups e.g. technical panels, expert working groups, and regional and national plant protection organizations (RPPOs and NPPOs), in particular the Technical Panel on Forestry Quarantine (TPFQ).

4. Partnerships and Co-operators

Develop partnerships and interact with co-operators that utilize shared resources to achieve common goals and objectives. Examples include the Phytosanitary Measures Research Group (PMRG), forestry panels of RPPOs, the International Union of Forestry Research Officers (IUFRO), the Food and Agricultural Organization (FAO) Forestry Department, etc.

5. Functions

IFQRG is an independent, open international body providing scientific analysis and review of global forestry-related phytosanitary issues. IFQRG partners with the CPM on forest quarantine issues by providing scientific information in support of CPM-related priorities relevant to the development and implementation of ISPMs.

The IFQRG serves as a forum for the discussion and clarification of key issues related to the phytosanitary implications of global trade with forest plants and products through the following main functions:

- Produce and review work plans on CPM-driven priorities and those of other clients, such as providing the scientific foundation for the development of phytosanitary standards and their implementation and guidance on ISPMs. Work plans will generally cover a two-year period.
- Identify, coordinate, and undertake international collaborative scientific research aimed at high priority forestry quarantine issues.



- Encourage multilateral discussion about forestry quarantine issues with the goal of delivering recommendations on these issues to our clients.
- Support the development and implementation of new phytosanitary treatments and measures through the preparation of guidance documents on their implementation, revisions to existing treatments, and criteria and guidance on how to conduct reliable research on new treatments.
- Approve and publish peer-reviewed abstracts of presentations and other member-produced meeting documents on IFQRG's website and other venues as appropriate.
- Initiate and/or contribute to the development of phytosanitary resources to explain forest-related aspects of new and existing standards (e.g., treatments and measures, surveillance, pest control measures).
- Designate working groups and identify tasks of these groups.
- Consider the environmental and economic implications of IFQRG's recommendations.

6. Rules of Procedure

The IFQRG Rules of Procedure will apply to IFQRG and working groups.

7. Structure

IFQRG is composed of scientists, technical specialists, plant health regulatory officials and others interested in developing scientific-based solutions to forest quarantine issues. From its membership the following committees and roles are formed:

- The Science Steering Committee (SSC);
- The Chair, Vice Chair and immediate past Chair;
- The Secretariat (Secretary and SSC);
- Working groups (WG).

8. Science Steering Committee

The Science Steering Committee (SSC) oversees the activities of IFQRG, including;

- The screening and selection of IFQRG members;
- Deciding on meeting venues and dates;
- Developing meeting agenda;
- Summarising discussions and completing the meeting reports; and
- Appointing IFQRG roles.

In addition, the SSC forms working groups as needed, including a peer review group for reviewing IFQRG publications.

9. Chair, Vice-chair and Past-chair

The Chair:

- Provides leadership and oversight to the SSC;
- Coordinates and organizes meetings;
- Coordinates the work of working groups;
- Develops the annual meeting agenda;
- Controls activities during meetings of IFQRG;



- Serves on the IPPC Technical Panel on Forestry Quarantine;
- Reports to the CPM on IFQRG activities.

The Vice-chair works with the Chair to coordinate and organize meetings and develop the annual meeting agenda.

The Past-chair assists the chair and Vice-chair with tasks as needed.

10. Secretariat

The Secretariat, which include the SSC and the Secretary, is in charge of processing and posting of meeting documents, preparing and posting reports, and updating and maintaining the web presence.

During any IFQRG meetings, the Secretary is in charge of taking minutes.

11. Working Groups

Working groups (WGs) are formed from IFQRG members as required to address specific issues raised by IFQRG members or the Chair. A leader is appointed for each WG to report back to IFQRG on their WG activities.

12. Scientific Publications.

IFQRG members should acknowledge IFQRG in scientific publications and reports based on discussions, work products, and research produced by the group or by members of the group relevant to IFQRG's mission/goals. IFQRG members are encouraged to publish key IFQRG science in appropriate peer reviewed journals.

13. Provision of Resources.

Logistics (e.g., meeting room access, coffee breaks, A/V equipment) for IFQRG meetings are organized and provided by the host institution. Participants in IFQRG meeting activities voluntarily fund their travel and subsistence to attend. Funding for research conducted by IFQRG members is arranged by the researchers involved. Efforts are made to find support for developing country participation.

14. Amendments

Amendments to these Terms of Reference, if required, shall be approved by members at annual meetings of IFQRG.



Appendix 4: IFQRG Rules of Procedure

International Forestry Quarantine Research Group (IFQRG)

Rules of Procedure

Rule 1. Membership

To become a member of IFQRG, the individual submits a short biography or curriculum vitae to the Science Steering Committee (SSC) outlining research or other relevant experience. Membership applications will be accepted by the SSC if information on the applicant indicates they would be a suitable member of IFQRG.

IFQRG does not and shall not discriminate on the basis of race, colour, religion (creed), gender, gender expression, age, national origin (ancestry), disability, marital status, and sexual orientation, in any of its activities or operations.

Membership of IFQRG will be revoked by the SSC should a member fail to participate in IFQRG meetings or working groups for more than three sequential years.

All members of the IFQRG are encouraged to seek additional participation and regional representation.

Rule 2. Science Steering Committee (SSC)

The SSC members are appointed in open session by IFQRG members. The SSC is comprised of seven to nine members representing as many FAO regions as possible. Each member serves for a minimum 3-year term that commences at the appointment in session. SSC membership is renewable in session at the next full meeting of IFQRG.

SSC members may resign at any time on notification to the Chair. When such vacancies occur out of session, the SSC may select an interim replacement SSC member based on experience and relevance to IFQRG missions.

The SSC appoints individual committee members to the following roles: Chair, Vice-chair, Past-chair, and Secretary.

Rule 3. Decision making

IFQRG's decisions, positions and recommendations are agreed by consensus among the members and summarised in the meeting report. The meeting report captures relevant input by all the IFQRG meeting attendees.

When consensus on IFQRG decisions are unattainable among IFQRG members, the majority of members make the decision with the majority and minority opinions reported, including the scientific rationale supporting these decisions. When necessary, electronic communication among IFQRG members may be used to further discussions to reach consensus.

SSC decisions shall be made by consensus among SSC members.

Rule 4. Language

The working language of the IFQRG is English.



Rule 5. Terms of Reference

All activities of IFQRG should be in accordance with the Terms of Reference and approved IFQRG procedures.

Rule 6. Meetings

IFQRG's face-to-face meetings are called as decided by the SSC, generally on an annual basis with the date and venue set at least one year in advance, to accommodate meeting dates of client groups.

The SSC may also call occasional virtual meetings to conduct the business of IFQRG.

The SSC will develop and circulate a provisional agenda and formal invitation three months prior to the annual meeting.

The topics of interest to IFQRG are submitted to the Secretary at least one month prior to the annual meeting. The meeting documents should be submitted to the Secretary at least two weeks prior to the meeting.

All meeting documents, including presentations (with authors' permission), are uploaded and available in the Members area of the IFQRG website.

Rule 7. Inter-sessional work

The Working Groups of IFQRG conduct research, analyses, and prepare publications and/or presentations throughout the year under the guidance of the Chair via email discussions, virtual meetings or in-person meetings.

Rule 8. Reports

Reports from IFQRG meetings and working groups are approved by the SSC before posting on the IFQRG website (<https://www.ippc.int/en/external-cooperation/organizations-page-in-ipp/internationalforestryquarantineresearchgroup/>).

The IFQRG Chair provides a written report to the Commission on Phytosanitary Measures (CPM).

Abstracts prepared from selected presentations are peer reviewed and published as Proceedings on the IFQRG website.

Rule 9. IFQRG Website

The IFQRG Website is maintained by the SSC or SSC-appointed sub-committee. The IFQRG Website will be comprised of;

- A public area that will contain all SSC approved IFQRG annual meeting reports along with IFQRG contact details and a general description of IFQRG;
- A members-only area that can be accessed by password access only and will contain all meeting documents and other related IFQRG information that has been approved for posting by the SSC.

Rule 10. Amendments

Amendments to these Rules of Procedure, if required, shall be approved by members at annual meetings of IFQRG.