



Workshop on phytosanitary barriers for genetic resources

24 February 2021, online MS Teams

Executive Summary

Genetic resources (GR) conserved *ex situ*, *in situ* and on-farm offer the precious diversity for stakeholders to ensure and improve productivity and quality of crop varieties, animal breeds and forest tree species. Providing access to GR for end-users and other conservation communities requires compliance with relevant (phyto-)sanitary regulations to ensure health and safety of the material and prevent spread of regulated pests or diseases.

This workshop and the accompanying preparatory webinars, organized by the ECPGR Secretariat within the framework of the Horizon 2020 'GenRes Bridge' project, raised awareness and initiated discussions between GR managers on relevant (phyto-)sanitary regulations and highlighted issues affecting GR collections especially. Four case studies described current issues affecting *ex situ* seed and fruit tree field collections, proposed updates for import regulatory guidelines for *Vitis* germplasm and highlighted the detrimental effect of pests on forest genetic resources in Europe. Participants further confirmed the importance of effectively managing phytosanitary risks at an acceptable level and providing the quality assurances necessary to ensure that GR collections can be maintained and genetic material safely exchanged. Potential collaborative actions were identified to collectively move into a direction of increased safety with appropriate and ideally harmonized protocols. The results of this workshop will be communicated to the regulatory agencies for further cooperation and feed into the developing European Genetic Resources Strategy and domain-specific strategies and their approaches to ensure and improve conservation and sustainable use of GR by 2030.

Main takeaways from the workshop and proposed actions include:

- Current phytosanitary regulations may not be entirely applicable or suitable for genetic resources management, and adequate amendments or exemptions for specific cases should be considered.
- GR networks should foster the dialogue with regulatory agencies, especially the European Commission, representing the interests of their stakeholders and providing feedback where possible.
- GR networks should assist their stakeholders with the interpretation of applicable regulations, potentially creating task forces or helpdesks to help stakeholders interpret and implement regulations.
- Similarly, collaboration across domains and with other stakeholder groups globally should be encouraged to share knowledge, create initiatives and build capacity.
- Development or updating of voluntary technical guidelines, together with specific protocols and trainings of relevant staff are needed for different domains and crop groups.
- Phytosanitary as well as animal health issues should be reflected in the European Genetic Resources Strategy, and options for joint actions considered in its implementation.



Preparatory Webinars

Due to the limitations of holding the workshop online, three preparatory webinars were organized to provide workshop participants with relevant background information on regulations and initiatives for plant and animal health. In the first webinar, Yannis Karamitsios, legal officer from the European Commission DG SANTE gave an overview of the EU Plant Health Regulation. In our second webinar, Lava Kumar from IITA Nigeria gave an overview of the activities of CGIAR genebanks, which conserve and provide large amounts of genetic resources worldwide through a network of germplasm health and safety units, and he also introduced the GreenPass initiative, which aims at creating an officially recognized quality assurance system for genebanks to facilitate material exchange. In the final webinar of the series, Fernando Tejerina provided information on specific provisions for genebanks within existing EU Animal Health regulations. The preparation phase was rounded by an invitation to our stakeholders to attend a webinar organized by the CGIAR genebanks where a global panel discussed a variety of issues related to “Germplasm health in preventing transboundary spread of pests and pathogens”. Video recordings of the webinars are available on the [workshop homepage](#).

Workshop

The workshop on 24 February 2021 was organised by the ECPGR Secretariat, within the framework of Work Package 3 of the Horizon 2020 SFS-28-2018-2019-2020 project GenRes Bridge (Joining forces for genetic resources and biodiversity management). In a morning session panelists introduced four case studies on phytosanitary issues encountered in GR management. During the afternoon session participants were split into three groups to discuss these issues and brainstorm possible actions or solutions which were reviewed in plenary afterwards. The agenda is attached in Annex 1. The workshop was attended by 34 participants representing the three GR domains (participants list in Annex 2).

Case studies:

In the first case study, ‘[Phytosanitary regulations affecting ex situ seed collections](#)’, Willem van Doonjeweert (CGN, the Netherlands) introduced the phytosanitary practices at CGN to ensure the health of the collection. The Dutch national genebank expends a lot of effort and resources in ensuring seed health of their collections, actively monitoring crop regenerations and also testing for quarantine pests, often in collaboration with breeding companies. He highlighted that the frequent updates in existing regulation (due to change of pest status and newly emerging pests) pose a challenge to genebanks of all sizes, but especially small genebanks may not have the capacity to follow the changing regulations. A recent example is the *Tomato Brown Rugose Fruit Virus (ToBRFV)*, which has emerged since 2014, affecting primarily tomato and pepper and considered a quarantine pest in the EU. Due to its importance in trade, import of seeds into and exchange within the EU member states is tightly regulated and molecular testing required for all material, even for seeds in storage since before occurrence of the pest. This has effectively resulted in CGN stopping the provision of tomato and pepper seeds to users, and participants were invited to discuss possible solutions.

The second case study, ‘[Fruit Tree Genetic Resources: from maintaining to sharing material through Europe – issues with quarantine and ‘regulated non quarantine pests](#)’ was jointly elaborated by members of the ECPGR Working Groups of *Malus/Pyrus* and *Prunus*, Daniela Giovannini (CREA, Italy), Marc Lateur (CRA-W, Belgium) and Matthew Ordidge (Univ. of Reading, UK) and presented by Marc Lateur. He highlighted specific aspects of living collections of fruit trees, which need to be considered in

phytosanitary risk assessments, especially since they are usually vegetatively propagated through cuttings and are thus considered as high-risk plants in the EU plant health regulation. Phytoplasma (causing Apple Proliferation) and *plum pox virus* (causing sharka disease in stone fruits) are two relevant regulated non-quarantine pests (RNQP), which means they are present in the European region and cannot be eradicated, but propagation material should be certified to be free of the pests. Implementing a certification scheme was considered not feasible for genebanks, due to the high costs involved, but a number of actions were proposed to improve phytosanitary health of fruit tree collections. These included ensuring appropriate hygiene during bud selection and grafting, developing and regularly updating guidelines for the monitoring and safe movement of germplasm (based on technical guidelines for the safe movement of selected crops previously developed by FAO and IBPGR/IPGRI, but largely outdated), developing and implementing crop-specific genebank management standards, and implementing EU regulations for the exchange of material (e.g. plant passports). A specific point for consideration was made about the difference in symptoms that can be observed for the same pest in different tree genotypes. The difficulty of ensuring availability of material from fruit tree field collections was considered a bottleneck for inclusion of fruit tree accessions into the AEGIS European collection.

The third case study, '[Developing a proposal for phytosanitary regulation for import of *Vitis* germplasm to the EU](#)', was presented by Osvaldo Failla (Univ. of Milan, Italy). The origin of diversity of grapevine is found in Mesopotamia and the western Caucasus from where the crop has been disseminated all over the world in the last 7-8,000 years. During a COST action (East-West Collaboration for Grapevine Diversity Exploration and Mobilization of Adaptive Traits for Breeding – GRAPENET, 2010-2014), partners in 35 countries collaborated to map the diversity of *V. vinifera* germplasm, identify a grapevine core collection and ensure its conservation in European genebank collections. One product of the project was a proposal to simplify, unify and harmonize the regulation for grapevine (*Vitis vinifera* L.) propagation material introduction into EU for germplasm conservation, scientific purposes and breeding. This should apply only for GR purposes, namely the safety duplication of the core collection, which mainly consisted of material conserved outside the EU. The proposal was based on updating the FAO/IBPGR Technical Guidelines for the Safe Movement of Grapevine Germplasm (1991) and proposed an improved protocol and procedures for a number of relevant quarantine pests in compliance with the EU regulations in effect at the time (2014). However, this proposal was not taken up by the regulatory agencies.

The fourth case study, '[Phytosanitary measures – are they enough to protect our forests?](#)' was presented by Barbara Piškur (GIS, Slovenia). She highlighted increased threats to forest health that have affected European forests in recent years and are exacerbated by increases in trade and tourism as well as climate change. A number of important tree pests have been introduced into countries and subsequently spread, and effective implementation of phytosanitary measures is needed to protect forests. Two examples of important forest pests in the EU are *Bursaphelenchus xylophilus* (causing Pine wilt disease) and *Hymenoscyphus fraxineus* (causing Ash dieback), introduced from North America and Asia, respectively, and a serious threat to Europe's pine and ash forests. Due to the absence of effective genetic resistance, the only management options available are surveying, monitoring and sanitary felling of affected trees. The speed of Ash dieback spread through the continent after its first detection in Poland in 1992 highlights the need for comprehensive monitoring and pest risk assessment, which is difficult to implement for unknown pests. It is therefore important to increase capacity and collaboration of all involved stakeholders to effectively implement phytosanitary measures (e.g. diagnostics, surveys,

monitoring) and to raise awareness for the need to maintain healthy propagation material and genetically diverse forests.

Group discussions

During the afternoon session, the participants were split in three groups according to their background and expertise (*ex situ* seed collections, vegetatively propagated tree crops and forest genetic resources) to further discuss the described issues and brainstorm for potential solutions for GR management. The groups identified the main questions, issues and options for action, as listed below.

Group 1 (Phytosanitary issues affecting *ex situ* seed collections):

- Apart from the pests mentioned in the case study, a number of other quarantine pests are relevant for genebank seed collections.
- Genebanks want to ensure they do not distribute quarantine or regulated non-quarantine pests (RNQP) with their materials.
- Seed treatment prior to distribution (as done in commercial operations) could be an option for genebanks.
- The phytosanitary status of material present in genebank collections may not always be known (e.g. accessions incorporated from terminated breeding programmes could harbour unknown diseases).
- Pest status and corresponding regulations can change rapidly and it is therefore not always easy to be aware of what rules currently apply. Changes can affect planning of genebanks who typically work with limited resources.
- Some participants noted that it was not always clear what rules within the Plant Health Regulation (PHR) are relevant for genebanks and how the different regulations should be applied.
- Some genebanks still operate based on rules established with their National Plant Protection Organization before the new EU PHR came into effect, highlighting the need for improved communication between them and their national regulators.
- Different sources of information were sometimes inconsistent in their guidance on application of the regulations, e.g. about the question whether webshops do or do not need to include plant passports when distributing seeds. Similarly, the definition of “end user” was considered unclear, as the final consumer could be a hobby gardener or a farmer who may use the seed for commercial use.
- Some participants noted that genebanks could be considered webshops if they were using online request forms.
- Plant passports may or may not be required for material exchanged for scientific use. A unified interpretation of the regulation in this respect was considered important.
- The example of the genebank derogation within the EU animal health regulation (Commission Delegated Regulation (EU) 2020/686) facilitates exchange between AnGR genebanks only and is thus not 100% transferable to PGR genebanks.
- The EU PHR provides for some derogations and exemptions for scientific research and development. However, it was not clear to all participants what is covered by the exemptions, as for example breeding research would not always be destructive or done in quarantine conditions.
- Given that a number of GR stakeholders within the various domains (including ECPGR and EUFORGEN member states) are not EU members, the need for additional guidance on how to ensure continued cooperation with partners within and outside the EU was highlighted.
- Participants agreed on the need for clarification on what rules apply to what material.

- Participants agreed on the need to receive appropriate recognition when talking to the European Commission. Close collaboration between ECPGR and EC DG Sante on relevant issues should be fostered.
- The possibility for countries to propose amendments to existing regulations during meetings of the SCoPAFF (Standing Committee on Plants, Animals, Food and Feed) was noted.
- The Dutch genebank noted that they, together with the Dutch authorities, were working on a proposal for an amendment to include a ToBRFV derogation for historical genebank collections and invited other participants to lobby for support from their countries and the ECPGR community. Whether this could be implemented as a general protocol or whether the exemption should be specific for certain diseases, needs to be determined, but preference would be on using a risk assessment protocol rather than continuously changing lists of relevant pests.

Group 2 (Phytosanitary issues of vegetatively propagated and field collections):

- Apart from the pests mentioned in the case study, a number of other regulated non-quarantine pests are relevant for fruit tree collections.
- *In vitro* techniques are not much developed to serve for phytosanitary protection of fruit trees in genebanks.
- Previous legislation included an exemption for GR, but this was omitted in the current regulation, making it unsuitable for GR management. The existing exemptions for research (not GR) assume that research will be carried out in quarantine conditions, so they do not apply to GR conservation, especially for field collections.
- Although the existing Regulation offers derogations for GR for research, national systems do not always put them into practice.
- The EU regulation should be reviewed and adapted to provide possible derogations suitable for GR management of field collections. Work towards this and joint lobbying of stakeholders is needed.
- Could one possible approach be that genebanks are considered 'end users' rather than nurseries? This could apply whenever material is not further propagated and only used for breeding. However, this may be difficult to implement as genebanks should continue to provide material to other users.
- A priority should be to survey and improve health status of field collections of vegetatively propagated fruit trees in order to provide healthy material to users, putting in place a safe system for GR management under the responsibility of the genebank curator.
- Curators would benefit from additional trainings on phytosanitary protocols, including improving their knowledge of interpretation of symptoms.
- Third countries are required to prepare a special dossier for each species they wish to export to the EU, thus having to deal with export and import legislations in addition to ensuring the actual health of the material.
- Increased funding to support phytosanitary measures is necessary. In Germany for example the state of Saxony provides funds for phytosanitary tests for apple proliferation before distribution of material. This is an isolated example, but similar initiatives should be promoted.
- In order to include fruit trees in field collections in the AEGIS European collection, some of the requirements will have to be reconsidered. E.g. at the moment all accessions in AEGIS need to be present in at least one collection and one back-up location. If exchange of fruit tree material is impossible for phytosanitary reasons, this could prevent their inclusion in the European collection.
- Green Pass and centralized health center are part of a quarantine concept that would require a substantial investment at regional level and improvement of the techniques in order to become feasible for fruit tree germplasm exchange, while it is not easily applicable to field collections.

Proposals for actions and next steps for PGR:

- The ECPGR Secretariat should collect feedback received from the WGs on current legislation, including regarding amendments/derogations for GR management and exchange that are currently missing or not appropriately applied at national level.
- ECPGR was invited by DG SANTE to respond to questionnaires on the implementation and effectiveness of the new EU PHR by 9 May 2021. The questionnaire responses should be collated from the collected feedback.
- Establishment of a task force could be considered, to follow the regulation and interpret or translate into practical recommendations, working in effect as a helpdesk for GR managers and stakeholders and as an intermediate channel with DG SANTE.
- Training of curators should be organized on phytosanitary protocols (and guidelines updated)
- The ECPGR WGs should revise the AEGIS approach to make it suitable for fruit trees (need revision of expectations and practices)

Group 3 (phytosanitary issues of forest conservation units):

- The tolerance level for quarantine pests and regulated non quarantine pests (RNQP) is 0% for FGR to issue the EU plant passport. However, these regulations are most likely not enough as, the forest regenerative material (FRM) can be infected despite not showing visible symptoms (case study on *Phytophthora* in Norway) or can be infected with pests, which are not listed in the EU legislation
- Forests are vulnerable to quickly spreading pests.
- Issuance of a plant passport for seed does not always require testing, depending on the species and the origin of the FRM. Nurseries are allowed to issue plant passports under the new legislation, inspections have a lower mandate.
- Ornamental nurseries can potentially be the source of novel pests, especially if FRM are produced in the same nurseries. There's therefore a need to differentiate procedures or to better separate ornamental and forestry nurseries.
- Growing a large number of species in the same nursery might lead to transmission of pests to different species, especially for soil or water transmitted diseases like *Phytophthora*, while airborne diseases are typically more host specific.
- One solution to limit pest transfer via soil or water could be to produce trees in containers to be able to "rinse" the pathogens, thus container production systems should be improved and promoted.
- The voluntary schemes for pest free nurseries might help prevent spreading of pests that have reservoirs of inoculum in the soil/water.
- Mycorrhiza are known to provide protection to trees and could be considered a potential treatment of seedlings by mixing mycorrhizal inoculum in the soil during seedling production to protect seedlings against pest. However, more research is needed to identify suitable mycorrhizal species, isolates or combinations for forest tree species depending also on their provenances.
- The ultimate goal of FGR managers should be to conserve as much FGR diversity to maintain the option of adaptation via evolutionary potential.

Proposal for actions and next steps for FGR:

Within the current legislation the focus of actions for FGR managers should be to:

- Develop and adopt voluntary schemes and guidelines to avoid spreading of soil/water borne pests
- Keep ornamental and forestry nurseries separated

- Support research of interactions between forest trees, beneficial symbionts and pests
- Promote alternative production of FRM e.g. through containerised seedlings which allows rinsing the root systems to eliminate pathogens, or through development of (large scale) container production systems for large, possibly mycorrhizal seedlings (with specific reference to broadleaved trees)
- Support research into the genetic basis of tolerance to pests
- Raise awareness among general public on forest diseases (citizen science projects?)
- FGR conservation community needs increased training in detection of pests and pathogens and should consider them in conservation programmes

Plenary discussion

Points raised in the group discussions were brought back to plenary and a summary of main issues and possible actions and solutions collected that could be adopted by the GR domains. It was highlighted that the extension of the International Year of Plant Health (IYPH) 2020 until June 2021 should be used to promote plant health among ECPGR and EUFORGEN stakeholders and to raise awareness for the importance of the issues.

In principle, two main classes of actions could be identified: regulatory issues and implementation, the addressing of which will require substantial commitments and investments.

The current legislation was considered not suitable for GR and a need for derogations that are applied at national level was identified. Addressing regulatory issues will require close collaboration between GR stakeholders and NPPOs or EC DG SANTE in the interpretation or adaptation, respectively, of the EU PHR to make it better applicable to GR management. Implementation of the regulations will require awareness raising, investments in trainings and guidelines, and capacity building of GR managers to ensure the phytosanitary health of collections and enable safe material exchange. Although forest conservation work is different from crops, these principles are the same.

Phytosanitary issues should be integrated into the European GenRes strategy as well as the domain-specific strategies. It should be noted that the European strategy proposes establishment of a European center for agricultural GR (initially covering animal and plants); the TORs of such a centre could include dealing with related aspects of (phyto)sanitary issues as part of this approach in the long term.

Specific actions that could be considered in the short-term:

- A common interpretation of the text of the PHR should be developed and made available to clarify the regulation for actors involved with genetic resources conservation and use. (ACTION for the attention of DG Sante)
- A Task Force or helpdesk, possibly within ECPGR, should be created to help stakeholders interpret and implement regulations. (ACTION requiring investment)
- ECPGR and EUFORGEN should continue communication with EC DG SANTE, representing the PGR and FGR stakeholders, respectively. (ACTION for ECPGR and EUFORGEN)
- ECPGR should prepare a joint response of its stakeholders to the questionnaire on PHR developed by DG SANTE. This questionnaire is also open to the general public (on a subset of questions) and responses invited by 9 May 2021. (ACTION for GR curators and users and for ECPGR)
- Genebanks should lobby for a derogation applicable to historic material that cannot have been affected by emerging pests. The derogation should be considered for seeds and trees. (ACTION for genebanks)
- Improve and maintain health status of field collections of fruit trees: develop protocols, update technical guidelines, hold trainings etc. (ISSUE and ACTION, requiring investment)
- Revise the AEGIS approach to make it applicable to fruit trees (ISSUE and ACTION for ECPGR WGs)

- Coordinate with CGIAR genebanks to investigate how GreenPass could be implemented by European seed genebanks. (ACTION for ECPGR)
- Options for actions specific to FGR are voluntary guidelines for nurseries, to separate nurseries for different uses (ornamental vs. forest conservation). Foster research on beneficial microbes (e.g. mycorrhiza), training and awareness raising. (ACTIONS requiring investment)



Annex 1 – Workshop AGENDA

Wednesday 24 February – Morning session

Time	Topic	Presenter
9:15	Opening virtual space	
9:30	Welcome and Introduction Overview of the agenda, review of webinars, introduction of participants	Sandra Goritschnig (ECPGR)
9:45 – 11:25	Case studies of phytosanitary barriers experienced by genetic resources stakeholders (20' presentations + 5' Q&A)	
	1. Phytosanitary regulations affecting <i>ex situ</i> seed collections	Willem van Dooijeweert (CGN, The Netherlands)
	2. Maintaining and sharing fruit tree field collections – issues with phytoplasma and viruses	Daniela Giovannini (CREA, Italy), Marc Lateur (CRA-W, Belgium) and Matt Ordidge (U of Reading, UK)
	3. Developing a proposal for phytosanitary regulation for import of <i>Vitis</i> germplasm to the EU	Osvaldo Failla (University of Milan, Italy)
	4. Phytosanitary measures – are they enough to protect our forests?	Barbara Piškur (Department for Forest Protection, Slovenian Forestry Institute, Slovenia)
11:25 – 11:45	Short Discussion	
11:45	Lunch break	

Wednesday 24 February – Afternoon session

Time	Topic	Presenter
13:00 – 13:15	Brief recap and explanation of discussion format and breakout rooms	Sandra Goritschnig (ECPGR)
13:15 – 14:00	Breakout room discussions (rooms hosted by presenters of morning session case studies) Brainstorm ideas for solutions, recommendations, next steps.	
14:00 – 14:15	Coffee break	
14:15 – 15:00	Plenary discussion Summarize discussions and proposals from breakout rooms (~5 min per room) Discussion to propose recommendations to facilitate implementation of phytosanitary regulations in the GR context	Breakout room presenters all
15:00	Closure of the workshop	





Annex 2 - List of participants

First Name	Last Name	Organization	Country	Domain	Partner
Charlotte	Allender	University of Warwick	United Kingdom	Plants	
Beate	Berger	AREC Raumberg-Gumpenstein	Austria	Animals	
Michele	Bozzano	EFI/EUFORGEN	Spain	Forestry	X
Vanessa	Bryant	ECPGR Secretariat	Italy	Plants	
Dana	Constantinovi	Suceava Genebank	Romania	Plants	
Magda Bou	Dagher Kharrat	University of Saint Joseph	Lebanon	Forestry	X
Coralie	Danchin	ERFP/IDELE	France	Animals	X
Gordana	Đurić	University of Banja Luka	Bosnia and Herzegovina	Plants	
Osvaldo	Failla	University of Milano	Italy	Plants	
Bronislovas	Gelvonauskis	Plant Gene Bank	Lithuania	Plants	
Daniela	Giovannini	CREA-OFA	Italy	Plants	
Sandra	Goritschnig	ECPGR	Italy	Plants	X
Stefan	Haffke	EU Commission DG SANTE	Belgium	All	
Annette	Hägnefelt	Nordic Genetic Resources Center (NordGen)	Sweden	Plants	
Monika	Höfer	Julius Kühn-Institut (JKI) - Federal Research Centre for Cultivated Plants	Germany	Plants	
Maria	Jose Diez	Polytechnic University of Valencia	Spain	Plants	
Czesław	Kozioł	Kostrzyca Forest Gene Bank	Poland	Forestry	
Hojka	Kraigher	Slovenian Forestry Institute	Slovenia	Forestry	X
Marc	Lateur	CRA-W	Belgium	Plants	
Rik	Lievers	Centre for Genetic Resources (CGN)	The Netherlands	Plants	
Ulrike	Lohwasser	IPK Gatersleben	Germany	Plants	
Michael	Lyngkjär	Nordic Genetic Resource Center (NordGen)	Sweden	Plants	
Lorenzo	Maggioni	ECPGR	Italy	Plants	X
Mari	Rusanen	Natural Resources Institute (LUKE)	Finland	Forestry	X
Loredana	Maria	ECPGR Secretariat	Italy	Plants	X
Matthew	Ordidge	University of Reading	United Kingdom	Plants	
Barbara	Piškur	Slovenian Forestry Institute	Slovenia	Forestry	
Suzanne	Sharrock	BGCI	United Kingdom	Plants, Forestry	X
Silvia	Strajeru	Suceava Genebank	Romania	Plants	
Venche	Talgø	NIBIO	Norway	Forestry	X
Fernando	Tejerina	Ministry of Agriculture	Spain	Animals	
José Vicente	Valcarel	COMAV	Spain	Plants	
Willem	van Dooijeweert	Centre for Genetic Resources (CGN)	The Netherlands	Plants	
Theo	van Hintum	Centre for Genetic Resources (CGN)	The Netherlands	Plants	X
Marjana	Westergren	Slovenian Forestry institute	Slovenia	Forestry	X

