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ePhyto and ePhyto Hub Feasibility Study: Summary of the findings of the ePhyto Hub Feasibility Study
Agenda item 10.4.2
Prepared by the IPPC Secretariat (Summarised from the report produced by Bryant Christie Inc., International Affairs Management)

I.   BACKGROUND

1.   Over the last decade there has been an increasing interest in determining how National Plant Protection Organizations (NPPOs) could electronically exchange the information currently provided in paper phytosanitary certificates. A harmonized, universally accessible, entirely voluntary system[1] for the electronic exchange of phytosanitary certificates could:

- increase efficiency by enabling electronically gathered phytosanitary data to be submitted to the importing country electronically, rather than downloaded onto paper and shipped, and could increase efficiency by storing and accessing data electronically without manual data entry;
- reduce costs associated with printing and shipping paper certificates, and reduce those costs associated with sorting, distributing, retrieving and archiving paper documents;
- expedite communication on specific phytosanitary certificates between exporting and importing NPPOs, including increasing ease and transparency of reissued certificates;
- decrease fraudulent certificates and increase transparency of certificates that have been issued and received between NPPOs.

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[1] *An ePhyto system is intended to augment the existing paper based system. It would be available between countries choosing to exchange data electronically. It is not intended to supplant the existing paper-based systems for those countries preferring to continue using a paper-based system, or that are regulatory required to do so.*

2.   Given these benefits, several NPPOs have been exploring and developing different systems for the electronic exchange of phytosanitary certificates. As a result, concerns have been increasing that in the absence of international harmonization, a multitude of exchange formats and mechanisms could be created, in effect undermining some of the advantages of electronic exchange. This concern was emphasized at the meeting of the Open Ended Working Group on Electronic Phytosanitary Certification in Paris in September 2012. At that meeting the possibility of multiple electronic exchange systems requiring significant information technology (IT) investment, increase cost and present an insurmountable barrier-to-entry for countries with lower trading volumes or minimal IT resources. As a result, it was decided a harmonized approach should be pursued.

3.   These concerns were echoed during the 2013 meeting of the Commission on Phytosanitary Measures (CPM). The CPM identified the need for a program to guide the development of an electronic phytosanitary (ePhyto) certification system, and to identify the tools countries would need in order to access such a system. Given the likely adoption of Appendix 1 to ISPM 12 (Phytosanitary certificates) and "the number of countries already developing ePhyto systems that may not be compatible with each other", the CPM characterized the need to proceed as "urgent". An ePhyto steering group (SG) was formed with the purpose of developing a vision for the ePhyto concept and, among other objectives, monitoring the delivery of a hub feasibility study and making recommendations for how and whether the IPPC should be involved in its development.

II.   EXECUTIVE SUMMARY

4.   An **ePhyto certificate** is an electronic phytosanitary certificate. It is the electronic equivalent of the wording and data of phytosanitary certificates in paper form, transmitted by authenticated and secure electronic means from the NPPO of the exporting country to the NPPO of the importing country.

5.   At its most basic level, an **ePhyto system** involves **two national systems** and a transmission mechanism through which those two national (NPPO) computer systems exchange electronic phytosanitary certificates. An ePhyto system produces and transmits (providing for sending and receiving) electronic phytosanitary certificates. A **national system** is a component of an ePhyto system. It creates an ePhyto certificate and loads it into the **transmission mechanism** or retrieves (from the transmission mechanism) an ePhyto certificate sent by an exporting country.

6.   There are two primary **transmission mechanism** options. They are referred to as **point to point** and **single point**. A **point to point system** is a bilateral agreement between two countries (NPPOs) to exchange ePhyto certificates directly between their national systems. **A single point (hub) system** involves multilaterally established transmission/ retrieval requirements that all participating NPPOs accept, and that facilitate the exchange of ePhyto certificates between any two NPPOs participating in the hub.

7.   The advantages of a hub or a point to point option depends on whether the IPPC facilitates a single transaction control protocol (TCP) for the exchange of ePhyto certificates between NPPOs. If it does, then both options have different advantages and each NPPO will need to determine which approach best addresses its needs and concerns. If the IPPC does not facilitate such standardization, then a single point hub system has several operational advantages over the point to point option.

8.   Even if the IPPC adopts a single TCP, it is recommended the IPPC develop a hub as a means of facilitating the broad implementation of harmonized rules and schema.

9.   Common business rules, combined with a single transmission control protocol (TCP), would facilitate the exchange of ePhyto certificates even among NPPOs using different transmission options. This is why regardless of whether a hub is developed, broader and deeper harmonization of transmission protocols, schema, terms and business rules is necessary.

10.   The integrity of ePhyto certificates transmitted via the hub can be assured through three levels of security: system, data and transmission. Security of ePhytos transmitted via a hub would be further enhanced by the ePhyto certificates only moving through the hub; no data would be stored in the hub.

11.   Certificates being transmitted through an IPPC sponsored hub would remain the property of the two NPPOs involved.

12.   A hub should be organized so that the IPPC has no more legal liability with the exchange of ePhyto certificates than a postal service would in the event paper phytosanitary certificates were mailed and lost.

13.   The cost to develop a hub system varies depending upon what functionality is described in the scoping document, and the business rules decided upon by the SG. The features and services, not the number of participants, drive development costs.

14.   Based on the features and services discussed in this report, most likely, the development process (from scoping to delivery) would cost around US$300,000-$400,000. If a basic national system (that could be made available to all NPPOs) were to be included as one project element, then the costs could move into the US$450,000-$650,000 range.

15.   Maintenance cost, given no more than 6 million transactions annually, may be under $350,000 per year.

16.   Technical support and training seminars will be an essential part of a needed outreach program.

III.   RECOMMENDATIONS

17.   First, all IPPC members should accept and use the same transmission control protocol (TCP) for the exchange of electronic phytosanitary data. This would enable point to point and single point transmission options to co-exist and interface within a single IPPC sponsored ePhyto system.

18.   Second, in addition to establishing a single TCP, NPPOs should harmonize operating or business rules, and further harmonize codes, terms and schema. All NPPOs should agree to use the same version of the approved schema.

19.   Third, even if the IPPC adopts a TCP and adopts business rules and a more harmonized schema, it should still develop a hub as a means of widely implementing the harmonized business rules and transmission protocols.

20.   The next step in the development of an electronic phytosanitary (ePhyto) certificate system would be for the SG to develop a scoping document for an IPPC sponsored hub. The scoping document should stipulate that the hub be built such that:

- no records of transmissions are kept;
- ePhyto certificates are deleted from primary and backup servers once they have been received by the importing NPPO;
- verification business rules should require an XML pattern on "the outside of the envelope", so that the presence or absence of that XML pattern may be used to determine whether the certificate is valid;
- it uses https, which is a secure communications channel used to exchange information and uses a Secure Sockets Layer (SSL) and requires a SSL certificate on the receiving NPPOs national system. The use of additional layers of security, such as Virtual Private Network (VPN) tunnel, could aid in the establishment of a secure transmission;
- it can initially accommodate 3 million transactions annually and easily scale up to 6 million or more transactions per year.
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21.   The hub servers should be located in countries that legally protect the confidentiality of the data.

22.   If an IPPC sponsored hub is built, the IPPC should select a vendor to host it. A cloud platform, such as Azure, should be used.

23.   NPPOs, upon agreeing to participate in the ePhyto system, should agree to hold the IPPC harmless for system failure or data loss and recognize that they are voluntarily availing itself of a transaction option the IPPC has made available.

24.   Ongoing maintenance and operation of the hub should be paid for through a transaction fee. The fee would be set annually by the steering group based upon the previous year's maintenance costs and transaction volume, and projected costs and transaction volume.

25.   In addition to building a hub, the IPPC should build and make available a standard, basic national system. This "off the shelf" system is needed to facilitate many countries participating in the ePhyto system.

26.   The IPPC should provide training seminars on how to install, use and maintain the national system and the hub. This is an integral element of an outreach program that will be critical to a successful launch of the ePhyto system.

27.   The IPPC should retain a vendor to work with all members of the steering group. Prior to the end of 2014 this vendor should identify common or acceptable positions on business rules and transmission protocols for both the operation of an ePhyto system and a hub, and also further outline the needed outreach program.