



**AgEcon** SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

**SCANDINAVIAN FOREST ECONOMICS**  
**No. 41, 2006**



Proceedings  
of the Biennial Meeting of the  
Scandinavian Society of Forest Economics  
Uppsala, Sweden, 8<sup>th</sup>-11<sup>th</sup> May, 2006

Lars Lönnstedt and Björn Rosenquist (eds.)

Uppsala

# Implementing international standards for phytosanitary measures: impacts and challenges

*Majella Clarke*

## **Abstract**

To combat the introduction of exotic pests and pathogens via the trade of plants and wood products, phytosanitary measures have been applied at national and international levels. Over the last decade, the International Plant Protection Convention (IPPC) has established a total of twenty-four International Standards for Phytosanitary Measures (ISPMs) to facilitate the flow of trade whilst secure common and effective actions to prevent the introduction of pests from plants and plant products, and promote appropriate control and eradication measures.

These ISPMs are in the general process of being implemented by the IPPC's 144 members at their national levels. The broad context and nature of these ISPMs require both exporters and importers to have up-to-date information from guidelines, systems and requirements, to pest reporting and certification marks.

This paper will present a general overview on the role and function of phytosanitary measures in the trade of wood products at both the national and international level. It will examine the impact that specific implemented standards have had on certain wood product industries, using the ISPM No. 15 and its impact on the international trade of wood packaging materials as an example.

The paper concludes by addressing the imminent challenges of implementing financially viable bioinvasion prevention strategies at a global level. It will discuss the challenges that these ISPMs can have for developing countries. The overview should yield a deeper understanding into the role of phytosanitary measures and the various challenges that National Plant Protection Organisations (NPPOs) and exporters will face in meeting phytosanitary standards.

**Keywords:** Exotic pests, phytosanitary certification, plant protection organisations, trade, wood

## **1. The Importance of Phytosanitary Treatments**

Phytosanitary measures are becoming an increasingly important issue facing international trade and the sectors that exchange plant material. The accession of their importance can be attributed to the Convention for Biological Diversity (CBD) which released the finding that Invasive Alien Species (IAS) are the second most direct threat to endangered species after habitat destruction. Moreover, several studies in the last decade have emphasised that the economic cost of IAS in terms of eradication programmes and damage to the environment, can no longer be ignored.

Pimental et al (2000) estimate that non-indigenous species in the USA cause major environmental damage totaling approx. USD 137 billion per year. In this study, plant pathogens and pests attacking forest ecosystems caused the loss of approximately USD 7 billion worth of forest products each year in the USA, approx 30% of this is incurred by non-indigenous pests.

In Australia between 1966 and 2001, the cost for detection surveys and fumigation of West Indian Drywood Termite infested buildings and furniture amounted AUD 5.5 million. In Florida, USA, where the pest is a particular problem, annual pest control amounts to around USD 300 million annually (Wylie, 2001).

The agreed interpretation<sup>1</sup> of phytosanitary measures is "Any regulation, legislation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests or to limit the economic impact of regulated non-quarantine pests." (IPPC, 2006). There are a number of phytosanitary treatments that are applied to plant and wood products mainly affecting the agriculture and forest sectors. These treatments may or may not be approved by the IPPC and include:

**Fumigation** with such substances like methyl bromide, phosphine, sulfuryl fluoride, carbonyl sulphide. Only methyl bromide is an acceptable fumigant for wood at the moment, though other fumigants are in review. There is a present lack of experimental data of phosphine fumigation in relation to raw wood pests, but there is some possibility that this fumigant will be widely used in the future.

**Heat Treatment** is the process in which a commodity is heated until it reaches a minimum temperature for a minimum period of time according to an officially recognised technical specification. (ISPM No. 15, 2002).

**Kiln-drying** is the process in which the article is dried in a closed chamber using heat and/or humidity control to achieve the required moisture content. (ISPM No. 15, 2002).

**De-barking** is the removal of bark from *round wood* and is particularly important to the forest sector. De-barking does not necessarily make the wood bark-free. **Bark free wood** requires that wood from which all bark, excluding the vascular cambium, ingrown bark around knots, and bark pockets between rings of annual growth have been removed. (ISPM No. 15, 2002).

**Chemical Pressure Impregnation** (CPI) includes such processes like high pressure/vacuum process, double vacuum process, hot and cold open tank process, and sap displacement method.

**Irradiation** is treatment with any type of ionising radiation (ISPM No. 18, 2003) and includes gamma radiation, x-rays, microwaves, infrared, and electron beam treatment.

## 2. International Plant Protection Agreements

Article 20 of the General Agreement on Tariffs and Trade (GATT) allows governments to act on trade in order to protect human, animal or plant life or health, provided they do not discriminate or use this as disguised protectionism. The World Trade Organisation's (WTO) Sanitary and Phytosanitary (SPS) Agreement applies to all sanitary and phytosanitary measures which may, directly or indirectly, affect international trade. WTO members may maintain or introduce measures that result in higher standards if there is scientific justification or as a consequence of consistent risk decisions based on an appropriate risk assessment.

This exception, based on scientific evidence and risk, is the core of many disputes that surround the SPS Agreement. Consequently, to diminish the number of disputes, Article 3 of the SPS Agreement aims to harmonise SPS measures based on international standards, guidelines and recommendations. With respect to plant protection, the IPPC has the function of setting, harmonising and implementing International Standards for Phytosanitary Measures (ISPMs). However, neither the IPPC nor SPS Agreement supplement the other, rather they are complementary instruments where they overlap. Concisely, the SPS Agreement makes provision for plant protection in a trade agreement, and the IPPC makes provisions for trade in a plant protection agreement.

Suggestions for topics for ISPMs can be made by National Plant Protection Organizations (NPPOs), Regional Plant Protection Organizations (RPPOs), the IPPC

---

<sup>1</sup> The agreed interpretation of the term phytosanitary measure accounts for the relationship to Phytosanitary measures to regulated non-quarantine pests. This relationship is not adequately reflected in the definition found in Article II of the IPPC (1997).

Secretariat or the WTO-SPS Committee. Other organizations, industry groups or individuals may submit proposals for standards through the IPPC Secretariat. Priorities are established by the Interim Commission on Phytosanitary Measures (ICPM) in consultation with the IPPC Secretariat.

Once the standard is approved through various committees, it is implemented through 2 channels, either by a top-down approach from the IPPC to the RPPO to the NPPO, or by national delegates of the IPPC straight to their national NPPO.

### **3. National Plant Protection**

National implementation is a much more practical process and can take some time to change the current system. From the public sector, the quarantine and inspection services are most impacted. Many are currently going through a restructuring process to meet the demands of increasing international trade and risk of bioinvasion. Knowledge and information in national plant protection services require constant upgrading, which means the training and recruitment of officials is an on-going process. The international exchange of information on IAS also plays an important part in mitigating the risk of IAS. National plant protection organisations can and should play an instrumental role in sharing information on IAS, requiring technology and infrastructure.

The impact of ISPMs, RSPMs and national phytosanitary measures on the private sector, and specifically the trade of wood products, are also of a different nature. Increasingly, Phytosanitary certification and a variety of treatments, depending on the type of commodity, are required. Time delays at ports can lead to the expiration of phytosanitary treatments, and emergency measures can mean that whole consignments are destroyed or rejected. As a consequence, conforming to increasing number of pest control regulations will increase the cost of international trade in these products.

The bottom line for the quarantine and inspection services (public sector) is that even though the general inspection rate for most developed countries is in a general decline relative to import volumes, the prevention, control and eradication of IAS requires expert knowledge and modern infrastructure, which leads to increased operating costs.

### **4. ISPM No. 15**

To demonstrate the method of implementation of ISPMs and the impact and challenges that implementing ISPMs can have on the forest sector, we examine ISPM No. 15 *Guidelines for regulating wood packing material in international trade*. Some NPPOs have already started to implement this ISPM, while others are in the process. Wood packing material is commonly made of raw, low grade, wood that may not have been sufficiently treated to remove or kill pests. Often the wood packing material is re-used, recycled or re-manufactured. It does not have a trade commodity code therefore it is difficult to determine the origin of the material and its phytosanitary status. Moreover, it has been a pathway of many pests in which economic and environmental costs have been significant.

For example, the Asian long-horned beetle (*Anoplophora glabripennis*) was introduced via wood packing material from China to the USA in the late 1990s. The extent of the environmental and economic damage to New York City and Chicago is estimated to have a present value of USD 59 million over the next 50 years to eradicate and control in urban areas (APHIS, 2003). Due to the risks and international trade disputes, which resulted in approx. 220 standards to deal with individual pests, ISPM No. 15 was an important standard for protecting plants whilst facilitating international trade.

ISPM No. 15 requires the phytosanitary treatment of wood packaging materials. These include pallets, dunnage, crating, packing blocks, drums cases, load boards, pallet

collars and skids which can be present in almost any imported consignment. The standard sets out approved measures and measures not yet approved, but are under consideration.

The approved measures include Heat Treatment (HT), requiring the wood packing material be heated in accordance within a specific time-temperature schedule to achieve a minimum wood core temperature of 56 C for a minimum of 30 minutes. The other approved measure is fumigation with Methyl Bromide (MB) as set out in the temperature, dosage rate and minimum concentration schedule. Fumigation with MB has meet with a lot of international scrutiny, because the substance is being phased out under the Montreal Protocol, therefore it has been necessary to consider alternative forms of fumigation and phytosanitary treatment (as detailed in Annex III of the standard). De-barking may also be required, and depends on national standards.

After the wood packing material has undergone phytosanitary treatment with an approved measure, it must be marked with the IPPC mark that specifies the type of treatment and the two-letter ISO country code, followed by the producer number assigned by the NPPO. This naturally adds significant cost to the whole process.

## **5. Costs and Impacts**

Manufacturers of pallets and wood packaging material must pay for the treatment of their wood if they wish to export in the international market. ISPM No. 15 will affect the wood packaging material market. In the USA it is estimated to cost between USD 1.28 - 2.34 per pallet for firms that fumigate with methyl bromide without gas recapture. Because the gas recapture of methyl bromide is required in California and Texas, the cost of fumigating could be 30-50% higher. The cost of chemically treating a pallet would add approximately 25% to the cost of producing a pallet, which is about USD 7-8.

Given that methyl bromide is being phased out, many of the firms involved in pallet manufacturing are citing that heat treatment in a kiln is the way forward, considering the environmental implications of methyl bromide as an ozone depleting substance. In some cases heat treatment in a kiln can be argued as a cost minimising strategy as well, considering that heat sterilization takes around 5-8 hours and a kiln designed for large bundles can be more efficient than fumigation of bundles requiring some 16-48 hours of treatment (Petree, 2003).

It is estimated to cost between USD 20,000 - 50,000 to build a kiln dry structure, so that the cost per pallet will range between USD 2.50 - 5. However, as the technology develops and becomes available, it is expected that these costs should decrease. According to one kiln manufacturer, it may be possible for pallets to be kiln-dried for about USD 0.26 per pallet (APHIS, 2003).

## **6. Challenges**

The biggest challenge for the IPPC is to draft harmonised standards for phytosanitary measures and ensure that they are implemented by the NPPOs. This requires that the standards be technically sound, and can be scientifically agreed upon. Currently, many NPPOs favour their own standards over the IPPC's standards, citing that the IPPC's e.g. fumigation schedule, or required heat treatments are inadequate to exterminate specific pests of quarantine significance. This is particularly the case in Australia, New Zealand, and the USA.

The Working Group on the Role and Functions of RPPOs found that the RPPOs are independent organisations and not under the control or supervision of FAO or the IPPC. Some RPPOs do not have the capacity to implement IPPC tasks. However it is agreed that they have an important role in standard setting and collaborating with the IPPC. It was also agreed that RPPOs should be more prominent in information exchange and implementation

activities between the IPPC and the regional NPPOs. (FAO, 2004) Interestingly, some of the RPPOs have set Regional Standards for Phytosanitary Measures, which are not connected with the IPPC. For example the North American Plant Protection Organization (NAPPO) has its own set of RSPMs along with its own dispute settlement process. RSPMs No. 4, 10 and 11 are superseded by ISPMs No. 18, 17, and 15 respectively.

The IPPC recognised that there is an urgent need for many Less Advantaged Countries (LACs) to update policies, authority and corresponding organizational arrangements so that they can fully realise the benefits of free, fair and safe trade within their IPPC and SPS obligations (AITIC/FAO, 1998).

Most developed countries and economies in transition have well-established plant quarantine and inspection services, which have the resources to respond to standards, set by the IPPC. In contrast, developing countries are constrained in their quarantine efforts. For example, it was found that pest free areas and areas of low pest prevalence had not yet been identified on the African continent. Moreover, other problems faced include inadequate or obsolete phytosanitary legislation, absence of adequate information on pests, insufficient human resources and inadequate pest surveillance. Inspection and certification were only some of the problems faced when implementing phytosanitary standards in Africa (Olembo, 2004)

Suglo (2005) reports that Ghana's challenges and problems include incomplete pest records as a result of weak human and technical resources for pest surveillance, diagnosis and identification, pose a problem for pest risk assessments in Ghana. With respect to inspection and surveillance, there is limited expertise and capacities for import inspection and certification as well as destination inspection. Research is also limited as the quality of the PRA is based on the access to information including good libraries, Internet and ICT, which are inadequate in Ghana. As a result of constraints in research, data generation and documentation is very limited, thus resulting in poor decision-making. The current phytosanitary legislation of Ghana is out-dated and inadequate. The challenges for Ghana and its international donors is update current Phytosanitary legislation that meets international standards. In doing so, this would require to build expertise and capacity, committing financial resources to ensure adequate pest surveillance (Suglo, 2005).

## **7. Conclusion**

Phytosanitary treatments and plant protection are becoming increasingly important topics in the international trade of raw and semi-processed products from the forest and agricultural sectors, given the potential economic and ecological damage IAS. While a variety of phytosanitary methods exist, few are accepted in relation to raw wood products and there is a general lack of experimental data on potential substances for fumigation. ISPMs are in the general process of being implemented by NPPOs. However, implementation may take some time if the knowledge and infrastructure resources of a particular NPPO are constrained. ISPM No. 15 demonstrates the rationale for implementing an ISPM, even though treatment schedules and certification requirements are expected to increase the cost of WPM. Consequently, there are a variety of challenges for the various levels of plant protection organisations. Developing harmonised and feasible international standards will make the phytosanitary treatment and inspection processes more efficient and transparent. However, successful implementation will require enhanced knowledge, legislation and infrastructure at a national level, and development cooperation at an international level.

## References

- AITIC/FAO. 1998. Uruguay Round Agreements - Implications for Agriculture Forestry and Fisheries in the Less Advantaged Developing Countries. Session 4: International Plant protection in Trade. 22nd-23rd September 1998, Geneva, Switzerland.
- APHIS. 2003. Regulatory Impact Analysis of the Proposed Rule to Adopt the International Standard on Wood Packing Material in International Trade. Riverdale, Maryland, USA. 31 p.
- Convention on Biological Diversity (CBD). 2001. Review of the efficiency and efficacy of existing legal instruments applicable to invasive alien species. (CBD Technical Series No. 2) Montreal, Canada. 42 p.
- FAO. 2004. Working Group on the Role and Functions of RPPOs. Report, 8th July 2004. FAO Rome.
- IPPC. 2006. International Standards for Phytosanitary Measures (ISPM # 5 - revised) Glossary of Phytosanitary Terms. FAO, Rome. 23 p.
- IPPC. 2002. International Standards for Phytosanitary Measures (ISPM # 15): Guidelines for Regulating Wood Packaging Material in International Trade. FAO, Rome. 15 p.
- IPPC. 2003. International Standards for Phytosanitary Measures (ISPM # 18): Guidelines for the Use of Irradiation as a Phytosanitary Measure. FAO, Rome. 16 p.
- North American Plant Protection Organization (NAPPO). [Retrieved 18.02.06]. <http://www.nappo.org>
- Olembo, S. 2004. Problems Associated with the implementation of the ISPMs in Africa. AU/IAPSC 21st General Assembly held in Dakar, Senegal, 24-28 May 2004.
- Petree, J. 2003. Company Moves to Sterilization Kilns for Treating Pallets for Export. *Pallet Enterprise*, January 2003.
- Pimentel, D., Lach, L., Zuniga, R. & Morrison, D. 2000. Environmental and Economic Costs of Non-indigenous Species in the United States. *BioScience*. Vol. 50. No.1:53-65
- Suglo, J.V. 2005. Ghana's Experiences and Challenges in PRA. International Plant health Risk Analysis Workshop. Conference Paper and Presentation. October 24-28 2005. Niagara Falls, Canada.
- World Trade Organisation (WTO). <http://wto.org> [retrieved 10.02.06]
- Wylie, R. The Impact of Exotic Forest Pests in Australia and New Zealand. Exotic Forest Pests Online Symposium. April 16-29, 2001. <http://www.apsnet.org/online/ExoticPest/index.html> [retrieved 10.04.06]