

## Discussion Session

### What research is needed to improve systems to prevent introductions?

Led by Kerry Britton

USDA-Forest Service, Arlington, VA

A lively discussion by IUFRO participants identified the following information gaps:

Regulators and scientists need better systems to identify threats abroad; these would include more complete taxonomy and distribution data, and improved ways of sharing that information. An increase in the library of bar-coded pests would be helpful, but we need to be certain that the specimens used are correctly identified. Many recent breakthroughs in systematics have demonstrated that identifications need to be verified with new tools available. The need to keep such databases up to date is critical.

A sentinel tree network, such as that established through collaboration of INRA and the Chinese Academy of Science, and the New Zealand Biosecurity 3 program, would help identify pests before they reach new lands.

The importance of biodiversity in pest populations is becoming more evident, and current regulatory systems generally do not address this at levels below species. Population genetics tools now allow us to track the evolution of pests, and have demonstrated that host shifts and increases in aggressiveness are not uncommon as genotypes meet and mix. Therefore, the potential for adaptation needs to be considered as scientists and regulators prioritize risks.

Plants for planting are a major pathway for diseases, insect pests, and weeds. Scientists need access to information on what genera and species of plants are moving in trade, and their countries of origin, in order to develop mitigations to address the pests that could use these pathways. For high risk pests, production sites should be certified "free from".

The pathway analysis standard under the International Plant Protection Convention (IPPC) requires that regulations be technically justified based on information about known pests, how they enter a pathway and spread, and how they can be controlled. Instituting clean stock production systems for these known pests will provide some degree of protection from unknown pests with similar biologies.