Evaluation of Three Devitalization Methods for Plant Origin Materials as Quarantine Treatment at U.S. Ports of Entry

Hong Chen | *U.S. Department of Agriculture*

Plant origin materials with quarantine concerns are seized, held or otherwise intercepted by CBP or APHIS at ports of entry and Plant Inspection Stations. In the past two years, more than 13,000 species and subspecies of plant pests including viruses, bacteria, fungi, nematodes and insects were detected on these materials. Other groups of plant pests such as mites, mollusks and weeds may also be found with these materials. Although such quarantined materials by definition are not regulated garbage, they have historically been treated using the regulated garbage approaches such as grinding and discharge into an approved sewage system, dry or steam heat sterilization at 212°F (100°C) for 30 minutes followed by burial in a landfill, or 6' deep burial with double plastic bags within 24 hours, mainly depending on the available devices and facilities on site.

A preliminary literature review on the three destruction and disposal treatments against the regulated plant pests is summarized here. With high confidence of efficacy, each of the three devitalization methods has been used to treat some species in every groups of plant pests associating with the plant origin materials. However, the predicable efficacy of a treatment method for a whole group of plant pests may not be sure because high distress tolerances to the treatment lethal factors exist in certain species of a particular group of plant pests. Given the uncontrolled or untested parameters such as temperature and time in the three methods and certain forms of life stages such as bacterial endospore and fungal sclerotium and teliospore, the efficacy of some methods is difficult to predict. With minimal literature of direct relevance to efficacy of these methods against the regulated plant pests, more research will be needed on some regulated plant pests with known high distress tolerances in order to confirm and ensure the treatment effects.