Regulatory approval processes for release of *Puccinia* spp. for biological control of *Carduus* and *Centaurea* spp. in the United States

W.L. Bruckart and D.G. Luster

United States Department of Agriculture, Agricultural Research Service, Foreign Disease–Weed Science Research Unit, 1301 Ditto Avenue, Fort Detrick, MD 21702, USA

*Puccinia carduorum* and *P. jaceae* var. *solstitialis* have been evaluated and proposed for introduction into the United States (US) for biological control of musk thistle (*Carduus nutans*) and yellow star-thistle (*Centaurea solstitialis*), respectively. In each case, limited non-target infections were noted under containment greenhouse conditions. Also in each case, a related *Puccinia* species from the US was used in greenhouse comparisons with the candidate agent to resolve questions about potential non-target effects in nature. A strain of *P. carduorum* already present on slenderflower thistle (*Carduus tenuiflorus*) in California, USA, was used in comparison with the candidate isolate from musk thistle. The yellow starflower thistle rust infected safflower (*Carthamus tinctorius*) under greenhouse conditions, and a US isolate of safflower rust, *Puccinia carthami*, was used for comparison. During each risk assessment, interest groups were informed about conclusions that non-target species would not likely be damaged by the use of either organism. Artichoke and safflower growers in California, and representatives of the US Fish & Wildlife Service (F&WS) working with listed (Endangered or Threatened) plant species, were included as contacts. All requests for additional tests were honoured. The state departments of agriculture in Virginia and California, where releases were proposed, also provided approval to federal regulators. Proposals for release of each candidate also were reviewed by the Technical Advisory Group (TAG) and the Animal and Plant Health Inspection Service (APHIS), based on the recommendation of the TAG. A field study for *P. carduorum* was approved for one location in Virginia, and the rust has subsequently spread across the US to California. Notice of the proposal for *P. jaceae* has been published in the Federal Register for comment. A Finding of No Significant Impact (FONSI), thus concluding the approval process, is expected from APHIS. Release of *P. jaceae* is planned in CA, if approved.

Biology and host range of the Brazilian thrips *Pseudophilothrips ichini*, a candidate for biological control of *Schinus terebinthifolius*: US quarantine tests

J.P. Cuda, J.C. Medal, J.L. Gillmore and J.H. Pedrosa-Macedo

1Department of Entomology & Nematology, Institute of Food and Agricultural Sciences, University of Florida, PO Box 110620, Gainesville, FL, USA 32611-0620
2Neotropical Biological Control of Weeds Laboratory, Department of Forestry Sciences, Federal University of Parana, Curitiba, PR, Brazil 80210-170

Brazilian peppertree, *Schinus terebinthifolius* Raddi (Anacardiaceae), is an evergreen shrub or small tree native to Argentina, Paraguay and Brazil. This invasive plant, known as aroeira, aroeira-vermelha or aroeirada-praia in Brazil, was introduced into the United States as a landscape ornamental in the 19th century. Brazilian peppertree readily invades disturbed sites as well as natural communities where it forms dense thickets of tangled woody stems that completely shade out and displace native vegetation. It is a serious problem for natural resource managers in Florida and Hawaii, USA, because it reduces the biodiversity of the native plant and animal communities. In addition, direct contact with a toxic resin present in the leaves, flowers, and fruits can irritate the skin and respiratory passages of sensitive humans. Exploratory surveys conducted in Brazil produced several promising insect natural enemies. One of the most damaging is the thrips *Pseudophilothrips (= Liothrips) ichini* (Hood) (Thysanoptera: Phlaeothripidae). Feeding by the nymphs and adults kills the meristems and causes flower abortion. This type of feeding damage suppresses the growth rate of young plants and curtails seed production.