Resistance Research and Breeding are Key to Forest Health

Statement of Problem and Request

Single tree and ecosystem level damage from white pine blister rust.
Sources: Top - Frantisek Soukup, Bugwood.org; Bottom - Dave Powell, Bugwood.org.

Single tree and ecosystem level damage from emerald ash borer.
Sources: Top - Christopher Asaro, Bugwood.org; Bottom - Bill McNee, Bugwood.org.

Invasive species annually cost the United States more than $120 billion in damages[1]. Invasive, non-native, pathogens and insects challenge the economic and ecological state of our forests and ecosystems. Widespread diseases and insect pests of trees negatively impact national and local economies by causing declines in forest resource-based markets, disruption of tourism, and may lead to more wildfires, in addition to direct effects on human health[2].

In nature, trees, or "hosts", attacked by invasive, non-native species of pathogens and insect pests are not able to effectively defend themselves; however, many scientific and technological advances have been made to harness the natural defenses of tree and develop what is called "host resistance". This approach to management and conservation of affected trees and forest ecosystems represents the only practical solution to many tree-killing invasions. However, lack of funds and infrastructure has impeded crucial elements needed to carry out a successful program of research and implementation, including: germplasm collection, research on mass propagation techniques, tree resistance research, planting site availability, maintenance, and long-term monitoring.

To effectively develop a united framework of action, we advocate for the development of programs to ensure:

» Sustainable funding and permanent research facilities to conduct tree resistance research and development
» Long-term availability of expert staff and education programs to facilitate prioritized research
» Active participation of stakeholders in monitoring, conservation, and maintenance of forest ecosystems.

To address these priorities, we request support to establish a task force that would unify efforts. This task force should include leading academics in forest pathology, entomology, genetics, as well as economics and ecology; USDA Forest Service scientists involved in forest health research and management; industrial and environmental stakeholders; state agencies; Native American tribal entities; and representatives of local governments.

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[1] Pimentel, D., R. Zuniga and D. Morrison 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. Ecological Economics 52:273-288.

[2] Donovan, G.H., D.T. Butry, Y.L. Michael, J.P. Prestemon, A.M. Liebhold, D. Gatziolis and M.Y. Mao 2013. The relationship between trees and human health - evidence from the spread of the emerald ash borer. American Journal of Preventive Medicine 44:139-145.

Please see the following page of this document for a list of signatories, contributors, and endorsements.

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