Efficacy of Traditional Weed Biological Control

FY 2011 President's Budget

ISSUE

Exotic invasive weeds present one of the single greatest threats to the biological diversity of natural areas and the ecosystem services they provide such as grazing, timber products, freshwater, and recreational opportunies. Classical biological control, the introductionof exotic natural enemies to control exotic weeds, is the single most effective tool for controling weeds once they become widespread. However, the intentional introduction of exotic organisms for biologicical control presents substantial risks that must be addressed to improve the efficacy and safety of this tool for weed control.

IMPORTANCE

Biological invasions by exotic species cost the U.S. 120-135 billion dollars per year in control costs and reduced revenues. Biological control is the most cost-effective tool and the only tool proven effective for achieving control of many types of widespread biological invaders. However, as exotic organisms, biocontrol agents themselves can cause serious economic, ecological, and even human health problems when ineffectively used. Many of these negative side effects are associated with a traditional strategy of introducing many biological control agents of low efficacy for each target weed. There is a dire need to bring more surgical precision to the field of biocontrol through empirical research directed at increasing efficacy of individual agents and reducing the number of overall agents introduced per target weed. Because biocontrol provides natural self-sustaining control once agents are established, initial upfront costs are not only justified but extremely economical long-term investments.

EXPECTED OUTCOMES

Research in this field will greatly improve the success while simultaneously reducing the risks associated with biological control. By developing new information regarding how, when, and where successful biocontrol works, such research will provide the conceptual framework and guidelines for improved agent selection and improved selection of appropriate target species for weed control. Because increased agent efficacy has been linked to both higher biocontrol success and lower risk, advances in this field provide win-win results that are highly economical.

PARTNERS AND COLLABORATORS

- Universities throughout the Interior West.
- USDA: Agricultural Research Service, European Biological Control Laboratory (France); Animal and Plant Health Inspection Service, Plant Protection and Quarantine.
- USDI: Bureaus of Land Management, Reclamation, and Indian Affairs; National Park Service; US Fish & Wildlife Service; US Geological Survey.
- Centre for Agriculture and Biosciences International (CABI, Switzerland).

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