ARS Biocontrol Research Program

Invasive insect, weed, and mite pests pose one of the largest threats to U.S. agriculture and our natural ecosystems. Part of ARS's national program on Crop Protection and Quarantine (#304) is research to develop biological controls to these problems.

The point of the biocontrol research program is that natural enemies of pests can be turned into cost-effective control strategies while minimizing impacts on the environment and human health. But doing so requires developing an understanding of the biology of both pest and potential biocontrol as well as how the two intersect with the threatened crop and production practices or the ecosystem.

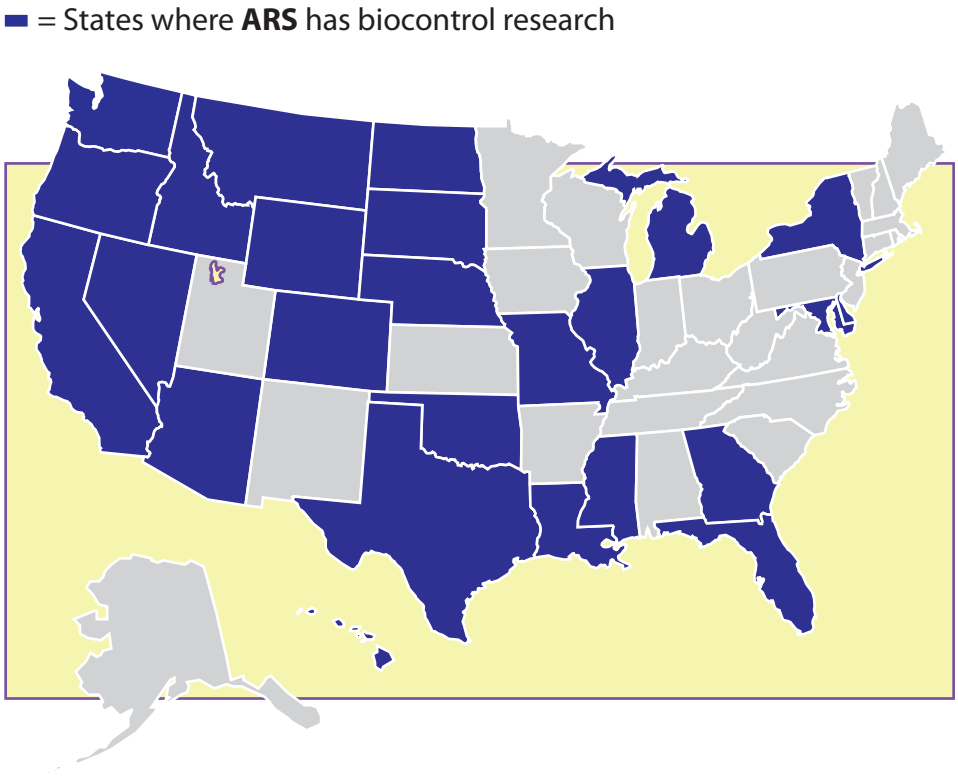
Other biocontrols include techniques such as release of sterile insects and use of pheromones to disrupt mating and population expansion.

While biocontrols for invasive pests represent a sustainable solution to manage pests, ARS usually views them as part of integrated pest management strategies involving careful use of pesticides, breeding more resistant crop varieties, and changing production methods.

ARS research looks at biocontrols that are part of large areawide programs as well as biocontrols that are applied in specific fields.

Because there are so many aspects to producing a successful biocontrol, this type of research requires collaboration among scientists from many disciplines: entomologists, plant breeders, geneticists, ecologists, plant and animal physiologists, and many others. The program also has ARS researchers working in close cooperation with other federal and local agencies and stakeholder groups.

For example, among ARS's most successful biocontrol projects has been the eradication of the screwworm from North America by release of sterile male insects.



The Animal and Plant Health Inspection Service (APHIS) works with Panama and Mexico to maintain a barrier of sterile males in eastern Panama.

Today, the ARS Screwworm Research Laboratory (SRL) in Kerrville, Texas, and in Panama, in cooperation with APHIS, is developing more effective and less costly methods of producing sterile males. SRL is also collaborating with the ARS Agroecosystem Management Lab in Lincoln, Nebraska, to identify oviposition attractants and the ARS Insect Genetics and Biochemistry Research Unit in Fargo, North Dakota, to introduce cryopreservation of screwworm embryos as a routine part of strain maintenance and to replace backup colonies. ✷