

# SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

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## Uninviting Uninvited Guests

Invasive species creep, seep and dig in deep.

*Invasive plant and insect pests cause \$138 billion in annual major environmental and economic damage nation wide. They are huge problems, and finding solutions is a huge job. The USDA/land-grant partnership enables pooling of resources and findings—saving valuable crops, restoring natural habitats, and improving biodiversity with economical and environmentally sensitive strategies.*

### Payoff

- **The place is bugged.** One way to combat damaging imported pests is to import their natural predators. The insect quarantine facility at **Montana State** is one of a few high-security containment labs in the United States doing just that. Researchers have approved the release of more than 40 exotic insects to control invasive plants, including purple loosestrife, spotted knapweed, leafy spurge, St. John's wort, and musk thistle. **Connecticut** researchers introduced more than 250,000 beetles into 37 locations in the state to weaken purple loosestrife's hold. Saltcedar spreads rapidly along river banks, displacing native plants and trees, consuming precious water and impeding drainage in the western United States. **Nevada** led a multistate effort that introduced a special Eurasian beetle to control the economically devastating brush. Researchers use their findings to launch a saltcedar biocontrol program slated for implementation in 14 western states in 2004.
- **Battle of the bugs.** Let the good bugs take on the bad bugs. The soybean aphid cuts soybean yields by 10 percent to 15 percent, or \$20 to \$30 per acre. **Wisconsin** researchers have found that farmers battling soybean aphids can reduce yield losses by 50 percent using two forms of biocontrol: the Asia multicolored lady beetle and a parasitic wasp. A **California** entomologist identified a parasitic wasp that effectively controls a destructive eucalyptus parasite. Thanks to this wasp, chemical treatments costing \$20,000 to \$30,000 per acre are no longer necessary. **Washington State** scientists found a tiny wasp, native to the Northwest, that parasitizes the Eurasian cherry bark tortrix moth. This moth is a serious threat to the multimillion dollar ornamental landscape and fruit plant industries of Washington, Oregon, and British Columbia.

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- **While you were “knapping.”** To control the noxious diffuse and spotted knapweed, **Washington State** researchers released more than 130,000 weed-feeding insects across the state. The biocontrol project has substantially reduced diffuse knapweed over thousands of acres in eastern Washington. Spotted knapweed alone has a \$46 million annual impact on Montana cattle producers. **Montana State** researchers rely on a weed-sniffing dog to spot small knapweed infestations. A global positioning system, or GPS, card on her collar tracks her travels and pinpoints plant locations on rangeland.
- **Position your assets.** Taking out some pests requires improved tactics in the invasive species strategy, education. **Ohio State’s** Master Gardener Gypsy Moth Specialization Program, **Arizona’s** Master Naturalist program, and **Alabama** Extension’s Cogongrass Eradication Demonstration Day programs educate trainers and use their trainees in research projects and monitoring efforts to help citizens control invasive weeds in their respective states. As part of **Colorado State’s** Native Plant Masters Program, public land-agency staff and volunteers are trained to educate others about the impact of weeds on native plants. This effort has helped homeowners and volunteers reduce or control noxious weeds on thousands of acres. In South Dakota, noxious weed infestations represent \$180 million in losses. Weed education programs from **South Dakota State** Extension have boosted weed control efforts by 10 percent statewide. That equals about a \$15 million benefit to crop production.
- **Parlor tricks and practical magic.** Varroa mites are exotic parasites of honeybees. These mites are controlled by synthetic miticides, but mites are now developing resistance. Collaborative research among **Georgia, Clemson, and Tennessee** has shown that a modified beehive floor device permits mites to drop out of the hive and die. Honeybees selected for genetic mite resistance also have significantly reduced infestations in colonies. In Georgia alone, these practices could save the industry more than \$680,000 annually. In Colorado alone, the Russian wheat aphid has cost more than \$132 million in crop losses. **Colorado State’s** Wheat Breeding and Genetics Program released more than 20 improved wheat cultivars with higher yields and pest resistance. These now account for roughly 60 percent of Colorado’s 2.6 million wheat acres. More than three-fourths of Kansas wheat acres are planted to improved varieties developed at **Kansas State**.



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