

# SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

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## The Invaders

Land-Grants and USDA foil yield-robbers and habitat hogs.

*They may seem innocuous enough, but when non-native plants, insects and diseases enter an area, they can be bullies. With no natural enemies, these invasive species take over in no time, destroying crops, waterways, native plants and habitat. Land-Grant Universities and USDA work together to manage or eradicate invasive species and protect the environment.*

### Payoff

- **Nixing noxious weeds.** Tall whitetop may look like a delicate flower, but the noxious weed has invaded thousands of acres in Nevada and is threatening water quality, wildlife habitat, recreational activities and the economic stability of ranchers and farmers. In 1999 **Nevada** Extension began the Tall Whitetop Initiative to control the weed. Public awareness efforts got Nevadans involved in the eradication and identification effort while extension mapped and inventoried the weed and demonstrated how to control it. As a result, 82 miles of tall whitetop were sprayed along the Walker River and 80 percent of the infestations in the Tahoe Basin were treated.
- **The scab stoppers.** Scab is blamed for wiping out the entire malting barley industry in North Dakota, South Dakota and Minnesota and has cost North Dakota and Minnesota farmers \$800 million in reduced yields since 1993. **South Dakota State** researchers are working to create scab-resistant wheat by identifying the fungal and wheat genes that play key roles in scab development. Previous work at **North Dakota State** resulted in Alsen, the first scab-resistant wheat variety. Related work is under way at **Kansas State**. During 1999, **Purdue** researchers developed minimal spray programs that effectively control apple scab on ornamental crabapples with half as many applications as a conventional spray program. **Cornell's** scab-resistant potato, Pike, accounts for \$10 million worth of the chipping potatoes grown in New York annually.
- **Achin' aphids.** Indiana farmers are facing a new pest, the soybean aphid, which has them scrambling to prevent damage to soybean crops. **Purdue** researchers studied infestation trends and found that the aphid posed little risk

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to the 2001 crop. As a result, Indiana farmers saved between \$500,000 and \$1 million statewide on unnecessary pesticide applications and associated costs. **Kentucky** scientists in collaboration with **Arkansas** researchers, also are studying the fast-moving aphid's impact in southeastern U.S. climates. Plant viruses transmitted by aphids can reduce yields by as much as 25 percent.

- **Piercing the wine industry.** A disease carried by the glassy-winged sharpshooter is threatening California's \$2.8 billion grape crops and \$13 billion wine industry. An estimated 1,540 of 2,800 acres of vines have been removed in the Temecula winegrape growing area since 1996 due to Pierce's disease. Caused by the deadly bacterium *Xylella fastidiosa*, Pierce's disease chokes off a grape plant's ability to pump water from the soil. Diseased plants usually die within a few years. **California** researchers are working with state and federal agencies and growers to manage the insect using biological, physical and chemical controls. In **Florida** researchers received a patent for the use of a group of genes expected to make grape plants resistant to Pierce's disease.
- **Water matters.** A South American weed is snaking its way through Louisiana, clogging bodies of water from canals and reservoirs to irrigation systems and marshes. *Salvinia molesta* forms dense mats, sometimes several feet thick. The largest infestation is on the Cameron Drainage Canal, where the weed spreads six miles long and two miles wide. Researchers fear for the state's rice crops. **Louisiana State** scientists are fighting back with the tiny *Cyrtobagos salvinia* weevil larvae. They expect their release in 2001 to pay off within one or two years. The weevil eats only salvinia so it will not affect other species. While scientists also are researching chemical controls, they predict the biological control will be more effective and cost less.
- **Oooo oooo, fire ants.** Georgians spent more than \$61 million in 2001 to control and repair damages caused by red imported fire ants, now found throughout Georgia. While the painful stings are annoying to anyone who gets in their path, fire ants are of special concern to farmers, turf care profes-

sionals, poultry producers, electrical equipment maintenance workers, the Department of Transportation and wildlife managers. Since 1990, **Georgia** research and extension faculty have conducted more than 125 trials on 95 fire ant control products and spread the word through publications, mass media and workshops. They've discovered management strategies that are both effective and economical. Using a combination of broadcast bait applications and individual mound treatments, they found fire ant populations can be reduced by more than 90 percent for as little as \$25 an acre per year. **Texas A&M** and **Auburn** researchers also are combating the ant. Extension agents in three Alabama counties have conducted experimental releases of phorid flies, which are intended to provide biological control of the ants.

- **Leaf our trees alone.** The southern pine beetle is the South's most destructive forest insect. The last outbreak in Georgia killed \$20 million worth of timber, and a current infestation is likely to exceed that. In the past, controls required extensive tree cutting or the use of pesticides. For this outbreak, **Georgia** has studied the success of natural products, including attractants, repellants and tree host chemicals in conjunction with **Texas A&M**, **Virginia Tech** and the Texas and USDA forest services. They've developed a control technique that uses synthetic anti-aggregation pheromones. The U.S. Environmental Protection Agency has approved the technique, which is being commercialized. The pheromones can be applied by one person, require little specialized equipment and do not require tree cutting or insecticides.



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