



Environmental Stewardship

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Safer, more sustainable pest management

Managing pests is essential to healthy, safe and productive agricultural, urban, residential and natural areas. But pesticides can cause air and water pollution and unintended harm to nontarget organisms. Pesticide exposure has also been linked to human health problems. In addition, many pests eventually develop resistance to commonly used chemicals, rendering those chemicals ineffective. Researchers and Extension educators across the Land-grant University System are developing alternative pest control methods and promoting proper pesticide application.

Here are a few examples of that work:

- Extension educators in **Texas** helped collect and legally and safely dispose of over 1 million pounds of surplus pesticides. This helps keep pesticide chemicals from running off or leaching into soils and water and saved each pesticide applicator an average of \$2,000 in disposal costs. *Texas A&M AgriLife Extension; fee-based funding, state appropriations* (See [full statement](#)).
- Pesticide spray applicators on citrus farms in **California's** San Joaquin Valley avoided 7,500 applications (over 768,000 pounds of pesticide) between 2016 and 2021 thanks to Extension recommendations and tools that improved pesticide spray efficiency. *University of California; state appropriations, Smith-Lever (3b&c)* (See [full statement](#)).
- In **Georgia**, pesticide drift complaints have dropped at least 80% since the inception of a pesticide stewardship program in 2015. During 2023, trainings reached pesticide applicators representing nearly 2 million acres of land in Georgia. The value of this program is estimated at over \$546 million. *University of Georgia; private grants & contracts, Smith-Lever (3b&c)* (See [full statement](#)).

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ABOUT LANDGRANTIMPACTS.ORG | This website documents the individual and collective impacts of the national Land-grant University System of joint research, education and Extension. Much of this work is supported by capacity and competitive funds through the USDA's National Institute of Food and Agriculture.

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Environmental Stewardship

- Using CRISPR/Cas9-mediated gene editing, **Pennsylvania** researchers and their collaborators made discoveries about tomato fruitworm caterpillars that could shed light on nonchemical ways to enhance plants' natural defenses to caterpillar feeding and additional stressors like drought and heat. *Pennsylvania State University; other, Hatch (See [full statement](#)).*
- Researchers in **Washington** used unmanned aerial systems (drones) to detect and map climate-induced changes in insect pest pressures in forest ecosystems, which will help guide fine-scale management of forests in the western United States, including when and where to apply insecticides. *Washington State University; McIntire-Stennis (See [full statement](#)).*
- With a unique approach that uses sentinel insects, researchers in **New Mexico** showed that natural predator control of insect pest eggs is often over 80% as long as predator populations are not disrupted by frequent insecticide applications. In just alfalfa and pecan, this level of control would save growers over \$6.5 million per year in chemical pest control costs and losses. *New Mexico State University; Other USDA Capacity – Research, Extension (See [full statement](#)).*
- Extension educators in **Oregon** shared weather-based models, insect trap data and other information to help mint growers cut back on insecticide sprays and time applications properly. This is critical for optimum control and minimizing environmental spillover effects. *Oregon State University; state appropriations (See [full statement](#)).*
- After engaging with Extension educators in **Wisconsin**, gardeners report that they plan to refrain from or reduce pesticide use during peak pollinator activity. *University of Wisconsin; state appropriations, Smith-Lever (3b&c) (See [full statement](#)).*
- Researchers in **Georgia** identified which snap bean and squash varieties are most resistant to sweet potato whitefly and most responsive to entomopathogens that can help protect vegetable crops from whitefly infestations. *Fort Valley State University; Other USDA Capacity – Research (See [full statement](#)).*
- Researchers in **Pennsylvania** made key discoveries about goldenrod's natural chemical defenses against gall flies that could illuminate ways to enhance crop plants' defenses against pests without the need for environmentally disruptive pesticides. *Pennsylvania State University; Other, Hatch (See [full statement](#)).*
- Over the last decade, English- and Spanish-language manuals, trainings, certification courses and plant diagnostic services provided by Extension educators across **Nevada** have led to a substantial reduction in pesticide residues detected in urban sites, including drinking water sources. *University of Nevada; Other USDA Capacity – Extension (See [full statement](#)).*
- After training by Extension educators in **Minnesota**, 84% of participants are more likely to consider pollinators and 75% are more likely to consider impacts to water quality before making any pesticide applications. *University of Minnesota; Smith-Lever (3b&c) (See [full statement](#)).*

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Environmental Stewardship

- In 2023, Extension educators in **Texas** provided training that helped thousands of pest management professionals receive the certification and licenses they need to perform their work safely. The economic impact of these job-sustaining training activities is estimated at more than \$255 million. *Texas A&M AgriLife Extension; Fee-based funding, state appropriations* (See [full statement](#)).
- Extension educators in **West Virginia** re-certify around 1,000 pesticide applicators each year, promoting responsible pesticide use in the state and potentially saving participants around \$423,000 in pesticide misuse fines. *West Virginia University; Smith-Lever (3b&c)* (See [full statement](#)).
- The Pesticide Applicator Report, developed by Extension educators in **Vermont**, includes up-to-date information about pesticide-related topics. Recipients report they are more likely to apply and use pesticides more safely. *University of Vermont; Other USDA Competitive, Smith-Lever (3b&c)* (See [full statement](#)).