

Weed Science Society of America

Policy Priorities: Ensure safe, secure, reliable food and fiber supply

The Weed Science Society of America (WSSA) is an organization that fosters an awareness of weeds and their impact on our environment. We provide science-based information to the public and government policymakers while promoting research, education, and outreach activities. Founded in 1956 as a nonprofit professional organization, WSSA has approximately 2,000 members from around the world. Members include academic, governmental, and private industry research scientists, students and educators, extension educators, and federal, state, county, and private land managers.



EXTENSION & RESEARCH:

Develop, educate, and deploy integrated and effective strategies to optimize weed management and preserve biodiversity through leverage of federal, state, and private funding.

- **Capacity funds** from federal appropriations are essential for supporting research, extension, and educational activities at land-grant institutions. Programs such as **Hatch and Smith-Lever**, provide resources for practical applications of research knowledge and dissemination of that information. These programs, partnered with the **Research Facilities Act**, are an investment that will serve as the backbone of cutting-edge research, extension, and applied science solutions ensuring that institutions can continue to innovate, educate, and contribute to the development of sustainable solutions for communities across the nation. In fact, estimates have indicated that agricultural research funding returns between 20-60%.
- The **Agriculture and Food Research Initiative (AFRI) Foundational** and **Applied Science Program** supports grants in six priority areas, which encompasses the weed science discipline aimed at advancing knowledge in both fundamental and applied research.
- **Crop Protection and Pest Management (CPPM)**: Addressing weed problems with applied solutions through the concepts of integrated pest management (IPM). The CPPM funds Extension IPM personnel as well as a competitive IPM grants program. The nationwide network of research and extension personnel collaborate with growers, regulators, and industry to meet local pest-management needs and enhance U.S. agricultural biosecurity in coordination with USDA-APHIS, NPDN, and IR-4.
 - **Regional Coordination Program (RCP)**: Funds four Regional IPM Centers to coordinate research and extension across 50 states. Program examples include:
 - **Northeastern IPM Center**: Developing a region-specific weed seedling emergence prediction model to inform management decisions.
 - **Southern IPM Center**: Maintains IT tools and tracks 350+ pests across 18+ crops, supporting data-driven decision-making.
 - **Western IPM Center**: Aids cheatgrass management using prescribed burns, herbicides, and biocontrol to reduce wildfire risk and restore native habitats.
 - **North Central IPM Center**: The *War Against Weeds* podcast delivers timely, science-based weed management information to farmers and agronomists.
 - **Applied Research and Development Program (ARDP)**: Funds new IPM technologies (e.g., laser/electric weeders; supported jointly with OREI).
 - **Integrated Weed Management (IWM)** funded through **Extension Implementation Program (EIP)** supports state extension activities to help farmers and communities implement multiple weed control methods, such as mechanical, chemical, and biological controls. Managing weed populations more effectively and sustainably, reducing reliance on herbicides while minimizing crop damage.
- **Interregional 4 (IR4)**: Since 1963, the IR-4 Project has brought together commodity groups, farmers, scientists, and industry to develop the data and scientific understanding needed to facilitate the registration of crop protection products for American grown fruits, vegetables, herbs, spices, and ornamental plants. The IR-4 Project contributes \$8.9 billion to the annual U.S. GDP and supports more than 123,260 jobs.



New York table beet yield with and without Weed Management



waragainstweeds.libsyn.com



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WSSA.net



ENHANCING INTEGRATED WEED MANAGEMENT:

Advanced and transformative tools through public-private partnerships

- Private industry collaborates with Land-Grant Universities to support research and extension efforts aimed at **developing new herbicide technologies**. These partnerships ensure that producers use these technologies safely and effectively. Public-private collaborations enable technological advancements to be tested across diverse environments.
- Advances in technology, including **robotics and machine learning**, along with the development of electric and laser weeding, have enabled targeted weed control. These innovations reduce impact on crops and migrant labor, while improving overall productivity across specialty crops such as strawberries, lettuce, apples, and grapes.
- Scientists studying weed biology play a pivotal role in the drive to retrofit combines with seed crushers to prevent further seed spread, implementing **harvest weed seed control (HWSC)**, for herbicide-resistant weeds like Italian ryegrass in wheat or Palmer amaranth in soybeans.
- Private industry partner with growers and university extension to implement **drone-based weed scouting systems** that generate georeferenced weed maps. These maps feed into **variable-rate herbicide application systems**, enabling targeted treatment with **precision application technology** within an **integrated weed management (IWM)** framework. The data-driven approach supports reduced herbicide use, better timing, and integration with mechanical and cultural tactics.



Electric Weeder in New Jersey Blueberry

ENSURING CROP PRODUCTIVITY & AMERICAN RESOURCES FOR GENERATIONS:

Advancing sustainable agriculture through IWM, environmental adaptation, and land stewardship.

- Herbicide Resistance Management:** University scientists partner with industry to study the mechanisms of herbicide resistance, refining the guidelines and practices to prevent and manage resistance in weed populations, ensuring herbicides remain effective tools for controlling weeds and protecting crop yields.
- Environmental Adaptation:** Research on the impact of weather extremes on weed species shifts, crop-weed interactions, led by weed ecologists aid in the development of adaptive management practices. These practices help farmers anticipate and mitigate the effects of variability on weed growth and crop productivity in addition to exploring potential new crops.
- Sustainable & Regenerative Ag:** The 35% increase in no-till across farmland has been enabled by the utilization of herbicides and herbicide-resistance crops, as documented by government and university researchers. Utilization of cover crops for weed suppression continues to gain in adoption. These transitions have reduced erosion while improving overall soil quality.
- Adherence to Pesticide Registration Improvement Act (PRIA) timelines are crucial as it fosters transparency, predictability, and accountability in the pesticide registration process. Stakeholders gain confidence in the regulatory process and their investments in innovation, knowing that decisions are based on thorough and timely evaluations at **EPA**. Collaboration with USDA's **Office of Pest Management Policy (OPMP)** not only ensures the safety and efficacy of pesticide products but alignment to grower needs.
- America's Land:** Supporting resilient working lands through stewardship, conservation, and modernization of the Endangered Species Act. We promote science-based legislation and collaborative land use policies to benefit both people and ecosystems.



Waterhemp in Iowa Soybeans



Herbicide Resistant Kochia in Washington Wheat

WORKFORCE COMPETENCY: Weed scientists protect food and fiber yields, as well as safeguard natural areas across academic, government, independent and industry sectors.

- Within USDA, scientists play a key role in **elucidating the mode of action** of natural herbicides, laying the foundation for the development of synthetic herbicides like mesotrione.
- Extension specialists provide **real-time recommended solutions** to weed resistance and management issues based on locally relevant research.
- The **collaborative regulation** of hydrilla control—developed by government agencies, evaluated by university researchers, and enforced with support from private industry—demonstrates an effective model for managing invasive weeds through **science-based policy** and coordinated action.
- In natural areas, IWM strategies targeting cheatgrass often involve partnerships of government and private ecological consultants to combine targeted herbicide applications, prescribed burning, and native reseeding efforts aimed at reducing fuel loads to reduce **impact of wildfires** and **restoring resilient plant communities**.
- Universal contributions to image repositories of weed species facilitate **instantaneous weed detection and management** by enhancing machine learning models with diverse, accessible, and accurately labeled visual data.
- Agronomy consultants increasingly incorporate cover crops into IWM systems, using species selection and termination timing to suppress weeds, **enhance soil health**, and reduce reliance on herbicides **promoting sustainability**.
- More than 250 people play a role in the **development of a single herbicide** product from discovery to commercialization, with weed scientists at the center.
- In less than 20 years, we have **lost >50% of the workforce skilled in weed science**. Support is needed to develop more capacity to **train the next generation** of weed scientists.



Students learning to identify and diagnose herbicide field injury



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