

WSSA Survey Identifies Gap Between Research Priorities and Skillsets

Respondents rank robotics and precision weed management among highest in future importance

Posted on May 15, 2024



WESTMINSTER, Colorado – 15 May 2024 – Technical competencies among weed scientists will likely need to expand quickly to accomplish future research priorities, according to recent results from a Weed Science Society of America (WSSA) online survey. The survey asked U.S. and Canadian leaders in weed science to identify pertinent weed research topics for the next five to 10 years. The survey also asked these leaders to identify expertise and funding gaps that are currently lacking to address the newly identified research priorities.

Survey respondents identified one particular concern related to skillsets needed for precision weed management and robotics. Precision weed management combines artificial intelligence (AI) and machine learning with ground robotics and unmanned aerial vehicle (UAV) technologies to map and identify weeds and implement management solutions for farmers.

“We see gaps in expertise in these areas,” says Vijay Singh, Ph.D., Virginia Tech Weed Science Assistant Professor, whose research team uses machine learning systems to generate weed databases. “That’s especially true with UAV-based herbicide applications, which require specific licenses and training, and data analytics expertise,” he emphasizes. “We do not find many people who possess these attributes. A similar challenge is finding engineering graduates—who have knowledge in areas such as AI and machine learning and are ready to work on interdisciplinary research.”

Survey Findings

Singh’s concerns reflect WSSA’s online survey [findings](#), which garnered 475 responses in nine research areas. According to the survey results, herbicides have greatly decreased as a research priority since WSSA last surveyed weed scientists in 2007, when herbicides far surpassed any other weed management research area in priority. This time, herbicides ranked third in priority among respondents (52%) behind cultural and preventative weed management (68%) and precision weed management and robotics (53%).

In contrast, most recent survey respondents (63%) reported expertise in herbicide discovery and development. Yet, just 8% identified technologies such as robotics and AI as an expertise area.

This gap in technology expertise among current weed science leaders runs counter to the promise that utilizing such advanced systems have for future weed control success, says Singh, whose team works on standardizing UAV-based herbicide applications in vegetables and row-crops. He

points to a recent Virginia Tech research finding that shows UAV-based herbicide applications provide greater efficacy at postemergence stages compared with conventional application systems. This is just one example that highlights the need for greater precision weed management expertise to conduct further research on adjuvants, nozzles, drift issues and machine vision to bring automation to agriculture.

Moving Forward

The WSSA survey also asked weed science leaders about research project funding. Respondents reported that public funding has declined since the last survey in 2007. Many also reported a concern that some important research areas—such as using cover crops and crop rotation that prevent weeds from emerging in the first place—might not attract private research dollars. Thus, the survey concluded weed scientists must stress the need for public money.

“We need more public funding for integrated weed management research, both fundamental and applied investigations,” says Muthu Bagavathiannan, Ph.D., Weed Ecology & Management Professor, Texas A&M University, who has conducted multiple pioneering research projects to foster precision integrated weed management. “More funding to accelerate the development and application of AI and machine learning technologies to improve the precision and efficacy of integrated weed management is particularly imperative.”

For more information on how to help the discipline of Weed Science move forward, consider joining WSSA as a [member](#) or contributing to its [endowment fund](#).

About the Weed Science Society of America

The Weed Science Society of America, a nonprofit scientific society, was founded in 1956 to encourage and promote the development of knowledge concerning weeds and their impact on the environment. The Society promotes research, education and extension outreach activities related to weeds, provides science-based information to the public and policy makers, fosters awareness of weeds and their impact on managed and natural ecosystems, and promotes cooperation among weed science organizations across the nation and around the world. For more information, visit www.wssa.net.

Media Contact:

Lee Van Wychen, Executive Director of Science Policy
National & Regional Weed Science Societies
Lee.VanWychen@wssa.net, 202-746-4686

This entry was posted in [Featured Articles](#), [Press Release](#).