WEED SCIENCE SOCIETY OF AMERICA WSSA

For Immediate Release

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New Studies Lift the Veil on Witchweed's Spooky Powers

May hold the key to more effective control of one of the world's most damaging parasitic plants

LAWRENCE, Kansas – October 29, 2015 – Just in time for the Halloween holiday, researchers are unearthing important new information about "witchweed" (*Striga* spp.) – a ghoulish, vampire-like pest that attaches itself to the roots of other plants to siphon away vital nutrients and water.

Witchweed can cripple important agricultural crops, including corn, sorghum, sugarcane, rice and other plants in the grass family. It is so dangerous it causes over $10 billion in crop yield losses in Africa alone. It has been named a Federal Noxious Weed and is illegal to import or to transport between states.

"Controlling witchweed has always been difficult since it wreaks havoc underground, away from even the most vigilant eyes," says Lee Van Wychen, Ph.D., science policy director for the Weed Science Society of America (WSSA). "By the time it emerges, the damage is already done and entire fields of crops can be destroyed."

Fortunately, new scientific studies released this year are giving researchers a better understanding of how witchweed picks its host plants and how we might fight back.

A fatal attraction

The many thousands of small, dust-like seeds produced by a witchweed plant can remain dormant in the soil for years. They will germinate, though, when a preferred host is growing nearby.

An international team of researchers led by David Nelson, Ph.D., at the University of Georgia set out to determine how witchweed seed "knows" the host plants are there. A paper published recently in the journal *Science* says they have discovered key facts about this phenomenon.

As crops germinate, they release hormones into the soil to attract beneficial fungi that provide much-needed nutrients. Unfortunately, those same hormones act as a beacon to alert witchweed and other parasites that a potential host is nearby. Nelson and his colleagues identified the specific genes that enable witchweed to sense the hormones from host plants.

That critical bit of information about how witchweed finds its victims may open the door to new controls. Researchers think it may be possible to introduce compounds that would interfere with witchweed's ability to detect host hormones – stopping witchweed seed from germinating.

Witchweed in the U.S.

Though witchweed is a native of Africa and Asia, it made its way to the North and South Carolina border more than a half century ago. A fierce battle has been raging since to keep the damaging weed from spreading to the Corn Belt. In 1957, the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) imposed quarantine restrictions on the infested land, and Congress allocated funds to launch the nation's first – and only – federal weed eradication program.

Thanks to close collaboration among federal and state officials and local farmers, an initial infestation that totaled nearly a half million acres has been significantly reduced to less than 2,000 acres today.

Bridget Lassiter, Ph.D., a weed specialist with the N.C. Department of Agriculture and Consumer Services, says North Carolina has just 65 infected fields in five counties that remain an active concern and are under quarantine.

Multiple treatments are being used to control the remaining witchweed infestations. The first step is commonly known as "suicide germination." Ethylene gas, a natural ripening agent produced by fruits, vegetables and flowers, is injected into the soil to encourage witchweed seeds to sprout. Without a host plant to attach to, though, the witchweed seedlings wither and die. As a second step, any witchweed plants that manage to emerge above ground are treated with herbicide, tilled or pulled by hand before they can produce seed.

Lassiter says frequent field inspections are critical. "Field surveys help us determine the effectiveness of the treatments we use and provide assurance that fields released from the program remain witchweed-free," she says. "In fact, we monitor fields for a full

decade after releasing them from treatment." That vigilance paid off recently when two previously released fields adjacent to areas being actively treated were found to be reinfested.

"The decades of time and effort involved in eradicating witchweed reinforce how important it is to exercise care when bringing plants or seeds to the U.S. from other countries," says WSSA's Lee Van Wychen. "Even a plant that seems relatively benign in its native habitat has the potential to turn into a damaging invader when transported into a new ecosystem."

APHIS is responsible for establishing import guidelines, inspecting living plants at ports-of-entry and enforcing the ban against witchweed and other plants that may become noxious or invasive weeds. It also remains involved in the witchweed eradication program in the Carolinas to this day.

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.

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Editors: A photo of witchweed is available for download at the following link: http://wssa.net/wp-content/uploads/witchweed.zip