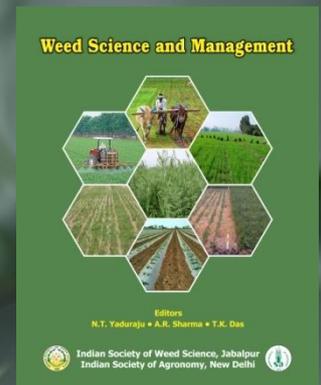
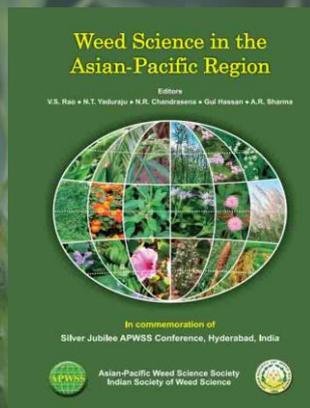
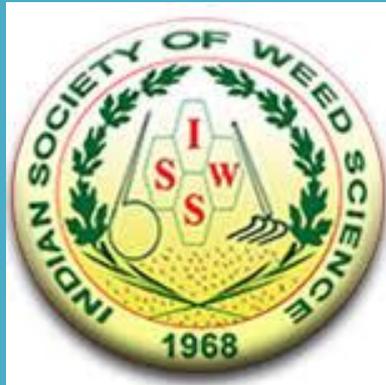


ISWS NEWSLETTER

A PUBLICATION OF THE INDIAN SOCIETY OF WEED SCIENCE

(January-June 2018)



Inside

- Robotic weeders
- Six way Resistance in Waterhemp
- Seed Destructor Technology
- Upcoming events in Weed Science
- Theses submitted



President's Message

We are closing in to celebrate “**50 years of Weed Research in India**” at the **Golden Jubilee Conference** of the Indian Society of Weed Science at Directorate of Weed Research, Jabalpur during 21-24 November, 2018. Members of the society have put lot of hard work and sincere efforts in organizing the same. The conference provides a unique opportunity to listen to the vast experience of weed scientists of international repute. Eminent personalities like Jonathan Gressel, Jonathan Storkey, Yoshiharu Fuji have accepted our invitation to be speakers in this conference. This will also provide a platform for all of us to deliberate upon emerging weed problems of the nation and developing strategies to contribute towards the national effort in doubling Farmers' Income through novel approaches in weed management.

Let us make it a very fruitful and successful event. This will also encourage young scientists and students to develop interest in the science of weed management. My best wishes to all the participants coming to the conference for a fruitful stay and enjoyment.

Dr. V.P. Singh
President, ISWS

Editor's desk.....



The ISWS-newsletter always attempts to keep its members informed about the current happenings in weed science around the globe as well as put on record the activities of the society and achievements of its members. This requires valuable inputs from the members time to time. This issue of the newsletter highlights some of the interesting approaches such as Robotic weeders, six-way herbicide resistance in water-hemp as well as seed destructor technology. The Golden Jubilee Conference of the ISWS is almost knocking. The galaxy of international weed scientists attending this conference has added to its importance in developing weed management strategies for the future. Hope we all have a great time at the conference.

Sincere thanks are due to all members who contributed for this issue of newsletter. Expecting still greater and active cooperation and contribution from the members in future.

S. K. Guru
Newsletter Editor

UPCOMING EVENTS

1. [ISWS Golden Jubilee International Conference](#)
Date- 21-24 November, 2018;
Venue: ICAR-Directorate of Weed Research, Jabalpur, INDIA
Link- <http://www.isws.org.in/Conference/Default.aspx>
2. [14th IUPAC International Congress of Crop Protection Chemistry"](#)
Date- 19 – 24 May 2019;
Venue: Ghent, Belgium
Link-<https://www.iupac2019.be/>
3. [1st International Molecular Plant Protection Congress](#)
Date – May 19-24, 2019
Venue- Adana TURKEY
Link- <http://www.imppc2019.org/>
4. [XIX International Plant Protection Congress - 2019](#)
Date- 10 – 14 November 2019;
Venue: Hyderabad, India
Link- <https://www.plantprotection.org/Meetings/InternationalCongress>

Calendar of Meetings of different societies worldwide

2018	Nov 19-22	Canadian Weed Science Society Annual Meeting, Niagara Falls, Ontario
	Dec 3-6	North Central Weed Science Society Annual Meeting, Milwaukee, Wisconsin
2019	Jan 7-10	Northeastern Weed Science Society (NEWSS), Baltimore, MD
	Feb 3-7	Southern Weed Science Society (SWSS), Oklahoma City, OK
	Feb 11-14	Weed Science Society of America Annual Meeting, New Orleans, LA
	Mar 11-14	Western Society of Weed Science, Denver, CO

Robotic Weeders

(Source credit: WSSA)

The growing popularity of robotic weeders for specialty crops has grown partly out of necessity, says Steven Fennimore, an extension specialist at the University of California, Davis. The need for robotic weeders stems from two issues. One is a lack of herbicides available for use in specialty crops like lettuce, broccoli, tomatoes, and onions for which not many herbicides are available or standardized. Second one is the cost associated with hand-weeding which has become more and more expensive over the years. Fennimore has been working with robotic weeders for about 10 years now. He works with university scientists and companies to engineer and test the weeders. The weeders utilize tiny blades that pop in and out to uproot weeds without damaging crops. He says that although the technology has not been perfectly standardized, still it is getting better and better.

Though the weeders are programmed to distinguish between a plant and the soil, the problem lies in recognizing the difference between a weed and a crop. According to Fennimore, some companies are training the machines to differentiate a lettuce plant from a weed. He's also working with university engineers on a system to tag the crop plant so the weeders will avoid it.

The cost of robotic weeders may be prohibitive initially, but it may be a better long-term option than expensive hand-weeding. Others think it's a lot of money for a new technology

Scientists Confirm First Case of Six-Way Resistance in Waterhemp

A study featured in the journal *Weed Science* is certain to keep many corn and soybean growers up at night. Researchers have identified a water-hemp population in Missouri that is resistant to a record-breaking six herbicide mechanisms of action.

On reports of a population of waterhemp resistant to 2,4-D in Randolph County, Missouri, researchers at the University of Missouri conducted field experiments that confirmed the 2,4-D resistance. But they also found the same waterhemp population was resistant to atrazine, chlorimuron, fomesafen, glyphosate and mesotrione. Of the eight herbicides applied, only dicamba and glufosinate provided acceptable control.

The results are sobering – especially for anyone waiting on the approval of 2,4-D-resistant corn and soybean as a way to manage glyphosate resistance. If we're already seeing 2,4-D resistance now, what will happen when use of the herbicide becomes even more commonplace?

Researchers say six-way resistant waterhemp demands a diversified approach. Rather than relying on glyphosate, 2,4-D or any other single herbicide, it's time to focus on a variety of appropriate cultural, mechanical and biological control tactics.

Seed Destructor Technology : Cutting down input into the seed bank (Credit: www.cottongrower.com)

In Arkansas agriculture, the fight against weeds has been an on-going war of attrition for decades. As weed populations gradually acquire resistance to several herbicides one after another, weed scientists and other experts with the University of Arkansas System, Division of Agriculture have encouraged growers to adopt cultural practices and other alternatives ranging from the use of crop rotation and cover crops to reduced row spacing.

Division of Agriculture researchers are embarking on a multi-year trial that will test the efficacy of a new machinery known as the Integrated Harrington Seed Destructor and its ability to aid the practice known as harvest weed seed control. The practice is intended to prevent weed seeds from making their way back to the seed bank during harvest, thus denying them the opportunity to germinate and grow in the following season.



Photo: Jason Norsworthy (left) and Tom Barber with the new Integrated Harrington Seed Destructor being evaluated in Arkansas. (Photo from University of Arkansas)

Originally designed as a trailer-mounted unit that was pulled behind a harvest combine on its own trailer, the new Integrated Harrington Seed Destructor (HSD) being tested on large research plots at the Newport Extension Center is

retrofitted into a John Deere 9760 STS. The HSD is powered by mechanical energy generated through a belt system attached to the combine's straw chopper. The destructor's grinder mill, which turns at about 3,100 revolutions per minute, effectively pulverizes anything put through it, ejecting a fine powder in its final stage. According to Jason Norsworthy, a Weed Scientist and Professor of Crop, Soil and Environmental Science for the Division of Agriculture, the integrated version of the equipment – originally designed and implemented in Australia – was a more practical choice for Arkansas farmers over the original design. Tom Barber, Extension Weed Scientist for the Division of Agriculture, pointed out that at the time of the HSD's widespread adoption in Australia, the nation had run out of control options for rigid ryegrass in wheat and other cereals.

Arkansas has pigweed populations that are resistant to four different modes of action, especially in northeast Arkansas. So researchers are embarking upon a new cultural practice that can reduce weed seeds going back into the seed bank. Palmer amaranth – commonly known as pigweed – has long been the bane of Arkansas growers' existence. The Integrated HSD may prove especially effective in cutting into the weed's survival, because approximately 99% of its seed is retained on the plant itself – a helpful fact when the plant is utterly pulverized during the destruction process.

Barnyardgrass, on the other hand, only retains about a third of its seeds, making it more difficult to impact the weed's soil bank numbers. Nevertheless, Norsworthy and Barber believe the HSD has the potential to significantly reduce the weed seed bank. "With Palmer amaranth, 95% or more of it will be gone from the seed bank within three years," Norsworthy said. "So by limiting these new introductions, we're going to quickly reduce the seed bank". The researchers warned, however, that no single practice should be treated as a cure-all.

This is definitely going to be an effective strategy to deal with herbicide resistance also. They said they'd like to have at least three years of data on the HSD's efficacy in the state.

Theses submitted in Weed Science

Ph. D. Theses:

Charan Teja K , Ph D (Agronomy): Weed management in conservation agriculture under rice-yellow sarson-green gram cropping system in lateritic soil of West Bengal. 2018. **Supervisors: Dr. B. Duary, Visva-Bharati, West Bengal.**

M. Sc. Theses:

Sudershan Mishra M.Sc. (Plant Physiology): Effect of Shading on growth, development and reproductive biology of major weed species of winter season. **Supervisor: Dr. S. K. Guru, Professor, Dept of Plant Physiology, G.B. Pant University of Agriculture and Technology, Pantnagar**

Prithwiraj Dey, M.Sc. (Agronomy): Weed Management Options in Spring Sweet Corn (*Zea mays* L. *saccharata*) **Supervisor: Dr. T.P Singh, SRO, AICRP on Weed Management Dept of Agronomy, G.B. Pant University of Agriculture and Technology, Pantnagar**

Miss. Krishna Ananya Sahoo, M.Sc. (Agronomy): Bioefficacy of new generation post emergence herbicides and their sequential application with pre emergence herbicides on performance of maize. **Advisor: Dr. Rabiratna Dash, Senior Scientist (Agronomy), AICRP on weed management, OUAT, Bhubaneswar**

Research papers presented at International / National Seminars

Mishra, M.M. (Professor and PI, AICRP-WM, Dept of Agronomy, OUAT, Bhubaneswar): Herbicides combinations for control of complex weed flora in direct seeded rice(DSR) under south eastern coastal plain zone of Odisha. In: "Natioanl Agronomy Congress on Redesigning Agronomy for Nature conservation and economic empowerment",20-22 Feb,2018, GBPUAT,Pantnagar, (**Oral Presentation**)

Dash R. (Sr. Scientist,Agronomy, AICRP-WM, OUAT, Bhubaneswar): Effect of different herbicides & its combinations on growth and yield of transplanted rice. In: "Natioanl Agronomy Congress on Redesigning Agronomy for Nature conservation and economic empowerment",20-22 Feb,2018, GBPUAT, Pantnagar,

The ISWS Newsletter is published by the Indian Society of WeedScience (ISWS) and distributed to members and other subscribers. The ISWS Newsletter welcomes news, letters, and other items of interest from individuals and organizations.

ISWS also publishes the '**Indian Journal of Weed Science**', its official Journal which contains original research and review articles

Mail your articles for publication in the newsletter to:

Dr. S.K. Guru

(Professor)

Editor, ISWS Newsletter

Department of Plant Physiology

G.B. Pant University of Agriculture and Technology

Pantnagar, India

Cell: 9411195441

Email: skguru123@yahoo.com

Newsletter design- Sudershan Mishra (PhD Scholar, Plant Physiology)