



January-June

2016

### **President's Message**

Shortage of labour is forcing more and more farmers to opt for herbicides. There is big job at hand for weed scientists to promote herbicide use with least complaints. Herbicides are not like any other pesticides as many, including our extension personnel think. We, weed scientists know that different herbicides are needed in different crops - often to control the same weed! The other important thing is the use of correct dosage. Unlike other pesticides, herbicides are to be applied at optimum doses. Lower doses may not control weeds effectively and higher rates may damage the crop. Uniform application of the herbicide at the recommended rate on a unit area of land is a prerequisite for good weed control. To ensure this, some homework on calibration of the spraying equipment is a must. Farmers and extension personnel need to be sensitized and trained about these aspects. Another important aspect which is blatantly misused is the use of proper nozzle. The spraying is often done on contractual basis where the interest is to cover more area with less spray volume. It is common to see in the field low volume sprayers with cone nozzles are being used. It is scary to see on some of the farms, the power sprayers being often used. Of course an old issue often not followed is the use of protective gear while spraying. It is important to follow strictly all the instructions concerning the safe use of pesticides. All these may look basic and very preliminary but the ground reality calls for urgent action on this. We are duty bound to ensure that extension personnel and the farmers are properly educated to prevent any untoward incidence arising out of pesticide application.

Keep up the good work!

**NT Yaduraju**

## Research Notes

### FOPS resistance in *Avena ludoviciana*- first case from India

A population of *Avena ludoviciana* Dur. (wild oat) was reported resistant to clodinafop in wheat in a farmer's field in Siswal village of Hisar district (Haryana), India. The farmer started using clodinafop in 2000 after its recommendation in 1999, till it failed to control *Avena* population during the winter season of 2012-13. Clodinafop was used continuously except one year rotation with sulfosulfuron after five years of clodinafop. Initially, farmer used lower rates (50%) for five years with satisfactory control, than resorted to full rate and finally two applications of clodinafop followed by fenoxaprop during 2012-13 was a perfect recipe for clodinafop resistance. Wild oat seed collected from the highly infested field in April 2014 were used for resistance evaluation during the winter seasons of 2014-15 and 2015-16 with different PRE and POE herbicides in the pots under screen house at Chaudhary Charan Singh Haryana Agricultural University, Hisar along with *in situ* field trials using PRE and POE herbicides. During the winter season of 2014-15, farmer was advised to rotate clodinafop with pinoxadane, which he applied in two fields, but in another one still used clodinafop tank mixed with isoproturon (a PSII inhibitor) and lost 75% crop yield from the clodinafop mixture.

The putative resistant (R) population exhibited resistance to clodinafop and fenoxaprop in the pot study during both the years. Clodinafop failed to control the R population in the infested field during 2015-16 further confirmed its resistance. The clodinafop treated wild population, was later controlled by 2X rate (growth stage) of pinoxaden. The resistance has also spread to adjoining areas under cotton-wheat rotation sequence and will be a big challenge in the future.



Heavy infestation of uncontrolled *Avena ludoviciana* from clodinafop (60 g/ha) followed by fenoxaprop 100 g/ha at farmer's field on 9<sup>th</sup> April 2014.



Wild oat from Siswal, Hisar, treated with pendimethalin 1.5 kg/ha (top row), Platform 385 (pendimethalin+metribuzin) 1.5 kg/ha (Middle row) and untreated plants (bottom row), 3 WAT on December 15, 2014 (L); Check, pinoxaden 50 g, clodinafop 60 g, fenoxaprop 100 g & sulfosulfuron 25 g/ha 3 WAT, January 5, 2015 (R)



Wild oat from Siswal (Top) and Hisar (Bottom), Check, clodinafop 60 g, fenoxaprop 100 g pinoxaden 50 g, sulfosulfuron 25 g, meso+iodosulfuron (Ready mix), 14.4 g, fenoxaprop+metribuzin (RM) 275 g, metribuzin 175 g and pendimethalin+metribuzin (RM) 1500 g 50 DAT, Feb. 4, 2015





Uncontrolled *Avena* from two applications of clodinafop, 70 DAT, Feb. 29, 2016



Clodinafop uncontrolled *Avena* (L) 40 DAT followed by pinoxaden 2X on Jan. 29, 2016, 30 DAT (Inset) and good control of *Avena*, by pinoxden 50 g/ha (RHS of main photo, 40 DAT)

**(Contributed by Dr. Samunder Singh, CCS HAU, Hisar)**

## **Abrasive weeding or "weed blasting": another weed management tool for organic farming**

In abrasive weeding, weed seedlings are blasted with tiny fragments of organic grit, using an air compressor. The stems and leaves of weed seedlings are severely damaged by the force of the abrasive grit applied at right plant growth of the weeds. It has the potentiality of reducing the use of tillage and hand weeding in organic agriculture. A two-year field study was conducted at the University of Illinois in organic tomato (*Solanum lycopersicum* L.) and pepper (*Capsicum annuum* L.) cropping systems by Dr. Samuel Wortman. Granulated walnuts shells and maize cobs, greensand fertilizer, and soybean meal, were used as abrasive-grits. Abrasive-grits were applied using compressed air between one and four times within planting holes of plastic mulch. The study revealed that: a) Weed density was reduced by 63% and 80% in tomato and pepper, respectively with two applications of abrasive grits, regardless of grit type; b) Broadleaved weeds were found more susceptible than grass weeds, to abrasive-weeding; c) Abrasive-weeding in conjunction with plastic mulch reduced final weed biomass by 69–97% compared with the weedy control, regardless of grit type or application frequency; d) an increase in yield of 44% and 33% of tomato and pepper respectively was observed with abrasive weeding treatment, despite minor stem and leaf tissue damage after applications.

Such innovative approaches may be tested in India as a component of Integrated weed management in different crops and cropping systems. Further details of the study can be obtained from: Sam E. Wortman. 2015. Air-propelled abrasive grits reduce weed abundance and increase yields in organic vegetable production. *Crop Protection*. 77, 157–162

**(Contributed by Dr. A.N. Rao, email: [anraojaya1@gmail.com](mailto:anraojaya1@gmail.com))**

## **Weed to Wood: Using Lantana for making eco-friendly wood polymer composites**

The scientists from Institute of Wood Science & Technology (IWST), Bangalore have reported that they were successful in converting a Lantana weed's wood to produce wood polymer composites (WPC) by using nanotechnology to mix Lantana wood and plastic. WPC can be used as cost-effective and eco-friendly alternatives for a variety of applications such as the construction of window frames, doors, and decks to make household items like furniture and foot mats. Till to date, in India WPCs are produced using imported materials. WPCs made from wood fibres, thermoplastics and biopolymers are called green composites which use recycled materials and are potentially biodegradable with recycling potentiality. Currently, the low-maintenance WPCs may not be as cheap as wood but as the market for this new product grows, the prices may come down.

The Forest Departments in different parts of India, normally cut down tonnes of Lantana weed and burn it. The Lantana weed regenerates as fast as it gets uprooted and burnt. Hence, the IWST scientists are currently working with the forest departments of Karnataka, Tamil Nadu and Punjab to tackle this menace by using it to make the wood polymer composites. A few NGOs, like the Shola Trust, are also reported to encourage the people living in tribal areas to use the wood for making furniture. These efforts of using Lantana weed are effective means of managing this invasive and fast spreading and poisonous weed. Such initiatives of managing weeds by using them are to be explored for other invasive weeds too.



Information and Photo source: <http://iwst.icfre.gov.in/>;  
<http://www.thebetterindia.com/62268/bengaluru-scientists-lantana-wood-polymer-composites/>

**(Contributed by Dr. A. N. Rao: [anraojaya1@gmail.com](mailto:anraojaya1@gmail.com))**

## Events

### 7th International Weed Science Congress held in Prague

7th International Weed Science Congress was held at Prague, Czech Republic during 19 to 25 June 2015. 628 scientists across the globe participated in the conference. 257 papers were presented orally in 4 plenary and 51 concurrent sessions. 388 posters were displayed during the conference period. Plenary papers were presented by Hermann Stubler on “Weed control at cross roads – which innovations are at the horizon”; Schulze-Stentrop on “Application technique - The challenge of future spraying”; L.H. Ziska on “Climate Change, CO<sub>2</sub> and the consequences for weed biology: Threats and opportunities”; and Petr Pyšek on “Global perspectives on plant invasions”. The theme of the congress was on “Weed Science and Management to feed the planet”. However, a larger number of papers, presented at the congress, were on herbicide resistance of weeds, indicating the severity of weeds resistance problem in developed world. At the congress, outstanding Achievement Award for 2016 were given to: Marco Quadranti (Switzerland); Bernal Valverde (Costa Rica); Jens Streibig (Denmark); Prasanta Bhowmik (USA) (Photo: 1). Large number of scientists from Asian-Pacific region have actively participated in the congress

(Photo: 2). The 8<sup>th</sup>International Weed Science Congress will be held in Thailand in 2020.



**Photo: 1.** Recipients of the IWSS Outstanding Achievement Awards – 2016



**Photo: 2.** Participants from India and other countries of Asian Pacific Region at the IWSS congress Prague.

**(News item by Dr. A.N. Rao)**

## Recognitions and Awards



**Dr R. K. Malik**, a Senior Agronomist with the International Maize and Wheat Improvement Centre's (CIMMYT) Sustainable Intensification Program based in Bihar, India was honoured with Crawford Fund's prestigious **Derek Tribe Award 2015**. Dr Malik received this award for his outstanding contributions to making a food secure world by improving and sustaining the productivity of the rice-wheat system of the northwestern and eastern Indo-Gangetic Plains, and for positively impacting the livelihoods of millions of farmers in India.

This award is made biennially to a citizen of a developing country in recognition of their contributions to research in agriculture or natural resource management in a developing country. As part of the Derek Tribe Award, each

recipient comes to Australia for two weeks to visit relevant agricultural centres. The intention is that, as a leader of research in their field, they will contribute to enhancing linkages between the recipient's home institution with similar bodies in Australia.



**Dr. Manpreet Singh**, Assistant Agronomist, Punjab Agricultural University, Regional Research Station, Abohar was awarded with the ICAR's prestigious "Jawaharlal Nehru Award 2015" for outstanding doctoral thesis in agricultural and allied sciences during the ICAR foundation day awards ceremony in New Delhi on 16<sup>th</sup> July, 2016. Dr Singh did his Ph.D. work in Weed Science on "Estimated critical period of crop-weed competition for different rice cultivars under

dry direct seeded system' under the guidance of **Dr. M.S. Bhullar**, Weed Scientist, PAU, Ludhiana.

*The ISWS congratulate both Dr Malik and Dr. Singh for their stupendous achievement.*

## New Office Bearers of International Weed Science Society

Elections were held for elections to the International Weed Science Society (IWSS) Board for the term of 2016-2020, prior to 7<sup>th</sup> IWSS Congress, for the positions of Vice President, Secretary and Treasurer of IWSS. At the General Body meeting by Dr. Nilda Roma-Burgos, President, IWSS has announced that: a) Dr. Samunder Singh (India) was elected as Vice President, IWSS; ii) Dr. Do-Soon Kim (Korea) was elected as Secretary, IWSS and Dr. Ian Cristofer Burke (USA) was elected unanimously as Treasurer, IWSS. Dr. Do-Soon Kim has served APWSS earlier as Secretary. All of them took charge of their respective positions and will hold the respective office during the term 2016-2020. Indian Society of Weed Science (ISWS) wishes them all the best in their activities to strengthen the Weed Science, globally.



**Photos:** Dr. Nilda Roma-Burgos, President; Dr. Samunder Singh, Vice President; Dr. Do-Soon Kim, Secretary and Dr. Ian Cristofer Burke, Treasurer of IWSS (2016-2020). ([News item from Dr. A.N. Rao, anraojaya1@gmail.com](#))

## **M.Sc. (Ag)/Ph. D. Theses**

**Chaitanya Prasad Nath:** “Influence of tillage nitrogen and weed management on wheat and their carry-over effect on greengram”. Ph. D. (Agronomy) thesis, 2016.

Supervisor: Dr. T.K. Das, IARI, New Delhi

**Anthony Imoudu Oyeogbe:** Nitrogen and weed management in maize-wheat cropping system under conservation agriculture”. Ph. D. (Agronomy) thesis, 2016.

Supervisor: Dr. T.K. Das, IARI, New Delhi

**Noor Mohammad Ahmadi:** Effect of phosphorus levels on yield and yield components of maize (*Zea mays* L.) in Kandahar, Afghanistan. M.Sc. (Ag) (Agronomy) thesis, 2016.

Supervisor: Dr. T.K. Das, IARI, New Delhi.

**Yousaf Khan Ziar:** Chemical weed management in wheat under semi-arid southern Afghanistan (Kandahar Province).

M.Sc. (Ag.) (Agronomy) thesis, 2016.

Supervisor: Dr. T.K. Das, IARI, New Delhi

## **Coming Events**

### **20<sup>th</sup> Australian Weeds Conference**

11-15 September 2016

**Venue:** Perth, Western Australia

For details: <http://www.20awc.org.au/>

### **2<sup>nd</sup> Agriculture and Climate Change Conference on Climate ready resource use-efficient crops to sustain food and nutritional security**

26 - 28 March 2017

**Venue:** Meliá Sitges, Sitges (near Barcelona), Spain

Abstract Submission Deadline: 17 October 2016

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The *ISWS Newsletter* welcomes news, letters, and other items of interest from individuals and organizations.

Address correspondence and information to:

**Dr. J.S. Mishra**

Editor, ISWS Newsletter

Division of Crop Research

ICAR Research Complex for Eastern Region

Patna 800 014, India

Cell: 08409899897; 09494240904

Email: [jsmishra31@gmail.com](mailto:jsmishra31@gmail.com)