

## From Director's Desk



Weedy rice (*Oryza sativa* f. *spontanea*) is an emerging threat to rice cultivation in many parts of India. It has acquired serious proportion to varying extent ranging from 10-45%, particularly in direct-seeded rice, in many states including Madhya Pradesh, Uttar Pradesh, Himachal Pradesh, Odisha, Jharkhand, Chhattisgarh, West Bengal, Bihar and Kerala. It is biosimilar to cultivated rice and competes with rice crop in the vegetative stage. It also has undesirable traits like vigorous growth, coloured pericarp, asynchronous maturity and dormancy of grains similar to wild rice. Weedy rice flowers much earlier than cultivated rice and produces grains that shatter easily, thus enhancing the weed seed bank in soil. These biosimilars are largely derived by hybridization of cultivated and wild rice species, viz. *Oryza rufipogon* and *Oryza nivara*.

There are no easy solutions for managing weedy rice and an integrated approach including preventive measures is needed to eliminate its infestation. Use of clean certified seeds free from weedy rice contamination are indispensable to check further spread in rice growing areas. Agronomic practices such as summer ploughing and stale seedbed for stimulating germination of weedy rice followed by shallow ploughing or application of non-selective herbicides, puddling followed by transplanting, growing of varieties with purple stem base or leaves for easy identification for manual removal, selective application of glyphosate on weedy rice foliage, checking growth of sprouts from harvested stubbles to prevent further seed set in the off-season etc. are employed to check weedy rice. However, there is a need to further standardize these technologies for large-scale adoption on farmers' fields. It is also essential to discover and document the genesis and magnitude of the problem in different rice ecologies and study variation available among accessions in terms of morphology, phenology and physiology. Molecular fingerprinting is essential to find out the relatedness of the available accessions and to ascertain the origin of the particular accession in a location-specific manner. At our Directorate, integrated efforts are being made for an in-depth study using a number of accessions collected from different locations through agronomical, physiological and biotechnological approaches.



## Research Notes

### Technique developed to germinate *Orobanche* seeds in laboratory

A simple and rapid technique to germinate *Orobanche* under laboratory conditions was developed that would facilitate the identification of *Orobanche* in the contaminated seed lots, using limited space and time. This technique can also be used in the quantification of the weed seed bank present in the soil for the management of *Orobanche*. Surface sterilized seeds were placed in Petriplates lined with moist filter paper and incubated at  $28 \pm 2^\circ\text{C}$  for 10 days for pre-conditioning in completely dark conditions. Pre-conditioned seeds were aseptically transferred on a bed made of sterilized sand, cotton and filter paper. Simultaneously, host plant seeds (mustard and tomato) were placed for germination in separate growth chamber. After germination, about 10 seedlings were carefully transferred to the container containing the pre-conditioned *Orobanche* seeds. *Orobanche* seeds were observed periodically

for different stages of germination and their interaction with the host. An overall germination of about 70% was recorded on mustard and about 63% on tomato in 20 days after pre-conditioning.



Germination of *Orobanche cernua* under controlled conditions

### Ready-mix of fluazifop + fomasafen for weed control in soybean

Several herbicides are available in the market for weed control in soybean but alone they are not effective against infesting weeds. Bioefficacy of a combination of fluazifop 12.5% and fomasafen 12.5% in soybean was studied in a field trial. The treatments consisted of 4 doses of a ready-mix of fluazifop + fomasafen (200, 250, 313, 500 g/ha), fluazifop alone, fomasafen alone, imazethapyr at 100 g/ha, 2 hand weeding and weedy check were laid out in a randomized block design with three replications. The experimental field was uniformly infested with *Echinochloa colona*, *Commelina benghalensis*,

*Dinebra retroflexa*, *Phyllanthus niruri*, *Physalis minima* and *Cyperus iria*. The post-emergence application of fluazifop + fomasafen at all the rates reduced the population of grassy as well as broad-leaved weeds in soybean. Superior yield attributing characters and effective weed control contributed to higher yields under higher doses of fluazifop + fomasafen ready-mix. The yields obtained in all the treatments were significantly superior to weedy check. Two HWs resulted in the highest seed yield (2.79 t/ha), which was at par with fluazifop + fomasafen at 500 g/ha (2.36 t/ha).

### Effect of fluazifop-p-butyl + fomasafen ready-mix on weeds at 45 DAS and yield of soybean

Treatment	Weed count* (no./m <sup>2</sup> )	Weed dry biomass (g/m <sup>2</sup> )	Seed yield (t/ha)
Fluazifop-p-butyl 12.5%+ fomasafen 12.5% (200 g/ha)	4.0 (16)	47	1.67
Fluazifop-p-butyl 12.5% + fomasafen 12.5% (250 g/ha)	3.7 (14)	33	1.95
Fluazifop-p-butyl 12.5% + fomasafen 12.5% (313 g/ha)	3.0 (9)	31	2.23
Fluazifop-p-butyl 12.5% + fomasafen 12.5% (500 g/ha)	3.1 (10)	27	2.36
Fluazifop-p-butyl 12.5% (125 g/ha)	4.5 (20)	66	1.61
Fomasafen 25% SL (250 g/ha)	4.5 (20)	57	1.69
Imazethapyr (100 g/ha)	3.6 (13)	36	1.99
2 HWs	2.1 (4)	8	2.79
Weedy check	7.4 (55)	115	0.87
LSD (P=0.05)	1.1	23	0.47

\*Data subjected to square root transformation, values in parentheses are original

### News

Dr. A.K. Sikka joined as Deputy Director General (Natural Resource Management), ICAR, New Delhi on 5<sup>th</sup> February, 2013. Dr. Sikka completed his graduation in agricultural engineering from Allahabad University, Naini in 1976 and post graduation (M.Tech.) from Indian Institute of Technology, Kharagpur in 1978. He did his Ph.D. from Utah State University, Logan, USA.



He joined ICAR as scientist in 1978 at the Central Soil and Water Conservation Research and Training Institute (CSWCRTI), Dehradun and rose to the position of Director, ICAR Research complex for Eastern Region, Patna. Dr. Sikka has served as faculty of University of Arizona, Tucson and Oregon State University, Corvallis, USA; as benchmark Basin Coordinator of Indo-Gangetic Basin, Challenge Programme of Water and Food of CGIAR; and Technical Expert, National Rainfed Area Authority, Planning Commission, New Delhi. He has been bestowed with numerous awards which include Dr. Rajendra Prasad Puruskar, Vasant Rao Naik Award, and ICAR Award for Team Research. Dr. Sikka has contributed significantly towards watershed management and irrigation water management in the country and abroad. We are sure that NRM Division will reach new heights under his able guidance.

DWSR family congratulates Dr. Sikka on his appointment and wishes him a successful tenure as DDG (NRM).

### DWSR Databases

Directorate has developed three databases namely Weed Seed Identification, Weed Seedling Identification and Weed Identification. These databases are available at website <http://www.nrcws.org/database>. This site is dedicated to informing people about weeds in India. It has been designed for the public, researchers and for students. The database on Weed Seed Identification helps in identifying the weed seeds. The purpose of this database is to assist those who attempt to identify weeds by their characteristic features.



### संसदीय राजभाषा समिति का भ्रमण

संसदीय राजभाषा समिति द्वारा खरपतवार विज्ञान अनुसंधान निदेशालय, जबलपुर में राजभाषा की प्रगति का अवलोकन करने हेतु 7.2.2013 को भ्रमण किया गया। समिति के सदस्य, श्री रघुनंदन शर्मा, संसद सदस्य (राज्यसभा), डॉ. (श्रीमती) बोच्चा झांसी लक्ष्मी, संसद सदस्य (लोकसभा) एवं श्री श्याम सुंदर, सचिव द्वारा निदेशालय में हिन्दी कार्यों की प्रगति का अवलोकन कर हिन्दी कार्य की सराहना की। इस दौरान निदेशालय द्वारा हिन्दी में किये गये कार्यों की प्रदर्शनी भी लगाई गई जिसे श्री रघुनंदन शर्मा, संसद सदस्य (राज्यसभा) ने काफी सराहा एवं निर्देशित किया कि भविष्य में हिन्दी कार्यों में बढ़ोत्तरी बहुत जरूरी है।



## Training Programmes

- A training programme on "Weed Management and Chemical Weed Control" was organized during 12-14 March, 2013 for the progressive farmers under Project Directorate ATMA, Parbhani, Maharashtra. In this programme, farmers and ATMA officials were trained about weed management.



- Quarterly Hindi Workshop on "Sansthan Mein Vitt Prabandhan" was organized on March 19, 2013 for Directorate staff.

## Kisan Mela

A Kisan Mela was organized at the Directorate on February 19, 2013. About 45 stalls from various organizations demonstrated their latest technologies and products. Around 5000 farmers from Jabalpur and adjoining districts participated in this programme. During the inaugural function, Shri Prabhat Sahu, Mayor, Jabalpur Municipal Corporation emphasized on adoption of modern technologies including weed control in agriculture in order to get more production and income. A technical session and field visit were also arranged during which farmers interacted with experts and discussed their problems related to weed management. Extension folders and related materials were distributed to the farmers, stakeholders and other visitors.



## A talk on Agropedia

Dr. N.T. Yaduraju, Special Project Scientist, ICRISAT, Hyderabad delivered a talk on Agropedia. He stated Agropedia as one stop shop for all information, pedagogic or practical knowledge related to extension service in Indian agriculture. This online knowledge repository consists of a social networking platform and distribution services of information to be accessed in multiple languages. This national portal hosts



wide range of agricultural information on a variety of crops, with an aim to empower farmers with crop information. Indian Council of Agricultural Research initiated this programme through National Agricultural Innovation Project (NAIP) during 2009. ICRISAT is the coordinator of this consortium.

## Research Advisory Committee meeting

The XVI Research Advisory Committee meeting of the Directorate was held on February 22-23, 2013 under the Chairmanship of Dr. R.K. Malik. Dr. A.R. Sharma extended a warm welcome to Dr. R.K. Malik, Chairman and other members namely Drs. R.S. Balyan, B.L. Jajali and B.S. Parmar. Director, DWSR made a brief presentation on research programmes and other activities undertaken during 2011-12. He covered the aspects related to (i) historical background (ii) facilities available (iii) staff strength, (iv) discipline-wise scientific strength, (v) research programmes, and (vi) meetings of last RACs, QRTs, IMCs and IRCs. Leaders of different programmes presented the research highlights. Every presentation was followed by threadbare discussion.



## ISWS: First meeting of newly-elected EC

After declaring the results of the election of ISWS, a meeting of the old and new EC members was held at the Directorate on February 20, 2013 to hand over the charge of the Society to the newly-elected office bearers. Dr. N.T. Yaduraju, ICRISAT, Hyderabad and Dr. A.R. Sharma, Director, DWSR took over as President and Secretary, respectively. The new EC came out with different strategies for revamping the Society.



## Personalia

### Awards and Recognitions

- Dr. Sushil Kumar, Principal Scientist (Entomology) was awarded Late Shri P.P. Singhal Memorial Award 2013 by the Society of Plant Protection Sciences at Goa during 27-29 January, 2013 for his outstanding work on biological control of weeds.



- Dr. Meenal Rathore, Senior Scientist (Biotechnology) received 2<sup>nd</sup> Best Poster Award under the theme "Management of biotic stresses" at ARRW Golden Jubilee International Symposium held on 2-5 March, 2013 at CRRRI, Cuttack.
- Dr. Yogita Gharde delivered special lecture on the topic "Statistics: An interdisciplinary approach in life sciences" on 8 February, 2013 at St. Aloysius College, Jabalpur.

## Participation in seminars / symposia / conferences / meetings

- Dr K.K. Barman attended RFD meeting held at IASRI, New Delhi during January 10-12, 2013.
- Dr R.P. Dubey attended the meeting of QRT draft report presentation before DG, ICAR at Krishi Bhawan, New Delhi on January 14, 2013.
- Dr. Anil Dixit attended "Zonal workshop for finance and account officers" held at CIFE, Mumbai on January 21, 2013.
- Dr. Sushil Kumar attended 10<sup>th</sup> National Symposium on "Biotechnological Approches for Plant Protection: Constraints and Opportunities" at ICAR Research Complex, Goa during 27-29 January, 2013.
- Drs. Shobha Sondhia and P. P. Choudhury attended "ICAR Chemists Conclave" at IARI, New Delhi during 14-15 February, 2013.
- Drs. Shobha Sondhia and Bhumesk Kumar attended "National Workshop on Foresight and Future Pathways of Agricultural Research through Youth in India" at New Delhi during 1-2 March, 2013.
- Drs. A.R. Sharma, D.K. Pandey, Raghwendra Singh, Meenal Rathore and Mr. Dibakar Ghosh attended the "ARRW Golden Jubilee International Symposium 2013" at CRRRI, Cuttack from during March 2-5, 2013
- Dr D.K. Pandey visited AICRP-WC centre at OUAT, Bhubaneswar for monitoring/evaluation of progress of research work on March 6, 2013.

## Participation in Kisan Mela

DWSR participated in IARI Pusa Krishi Vigyan Mela at IARI, New Delhi from 5-8 March, 2013 and exhibited its weed management technologies for the farmers.



## Radio Talk

Dr. P.K. Singh delivered radio talk on AIR, Jabalpur on "Ganne ki fasal mein khratpatwar prabandhan" on February 22, 2013.

## Technical Seminars

- Er. H.S. Bisen delivered a talk on "Design development and evaluation of different self-propelled power weeders in India and abroad" on January 31, 2013.
- Dr. C. Kannan delivered a talk on "Host-plant defense against parasitic weeds" on February 28, 2013.
- Dr. P.P. Choudhury delivered a talk on "Microwave: from kitchen to field" on March 30, 2013.

## Distinguished Visitors

- Sh. Prabhat Sahu, Mayor, Jabalpur Municipal Corporation on 19.02.2013
- Dr. K.K. Saxena, Director Extension, JNKVV, Jabalpur on 19.02.2013
- Dr. T.V. Muniyappa, Former President, ISWS on 20.02.2013
- Dr. N.T. Yaduraju, President, ISWS and Special Project Scientist, ICRISAT, Hyderabad on 20.02.2013
- Dr. Megh Singh, Professor of Weed Science, University of Florida, USA on 20.02.2013
- Dr. R.K. Malik, National Coordinator, CGIAR and Chairman, RAC, DWSR on 22-23.02.2013
- Dr. R.S. Balyan, Member, RAC on 22-23.02.2013
- Dr. Bhushan Lal Jalali, Member, RAC on 22-23.02.2013
- Dr. B.S. Parmar, Former Joint Director, IARI, New Delhi and Member, RAC on 22-23.02.2013
- Dr. B. Gangwar, Director, PDFSR, Modipuram, Meerut on February, 2013
- Dr. Sain Dass, Former Director, Directorate of Maize Research, New Delhi on 28.03.2013
- Er. A.K. Trivedi, Chief Engineer, CIMMYT-India, New Delhi on 28.03.2013

## Retirement

Sh. Jagdish P. Kori sought voluntary retirement as Assistant Administrative Officer on 31.01.2013



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