



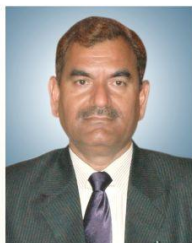
# WEED news



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## From Director's Desk



Weed problems are dynamic in nature. Despite development and adoption of technologies for weed management, the problems are virtually increasing. This is because of several factors, such as high-input agriculture, shift in weed flora, climate change, development of herbicide resistance in weeds, growing infestation of weedy rice and parasitic weeds, invasion of alien weeds due to globalization etc. In this context, we need to continuously keep on updating our technologies to meet the emerging challenges. We carried out an exhaustive exercise to revise ongoing research programmes at this Directorate. Based on the recommendations of the Research Advisory Committee (2009-2011), Quinquennial Review Team (2006-2012), and meeting convened by the Director General, ICAR and Deputy Director Generals of different divisions with renowned weed scientists of the country, we had an in-depth in-house discussion during the

Institute Research Council meetings in June, 2012. Accordingly, the Directorate has launched five major research programmes from 2012-13: (i) Development of sustainable weed management practices in diversified cropping systems, (ii) Weed management in the context of climate change and herbicide resistance, (iii) Biology and management of problem weeds in cropped and non-cropped areas, (iv) Environmental aspects of herbicides, and (v) Transfer of technology and impact assessment. Each programme is divided into specific focused sub-programmes involving multi-disciplinary team of scientists. Beside each scientist of the Directorate is also involved in Programme (v), and devoting 15-20% of his time for On-Farm Research and TOT activities.

During the period from April-June, 2012, the Directorate organized XX Biennial Workshop of the AICRP on Weed Control from 17-18 April, 2012 at KAU, Thrissur, in which, the technical programme was thoroughly discussed and revised. This was followed by the Biennial Conference of the Indian Society of Weed Science, in which, a major decision to unify the two factions of the Society was taken. The QRT conducted its review meetings on 2-3 May, 2012 at Jabalpur and 16-17 May, 2012 at New Delhi to finalise the report, which has been submitted to the Council on 06.09.2012. The IRC meetings were conducted on 14 and 16 June, 2012, in which, external experts evaluated the achievements made by the scientists and provided useful inputs. The 21<sup>st</sup> meeting of the IMC was held on 30 June, 2012 after a gap of 3 years, and major decisions for improving the research and development infrastructure of the Directorate were made.

All these initiatives taken by us require sincere and dedicated efforts by all the staff members of the Directorate as well as of the AICRP on Weed Control to make a visible impact of weed management technologies on agricultural productivity in the country.

## Research

### Integrated weed control measures in the system of rice intensification

A technology based on chemical device integrated with mechanical way was developed to manage weed problem on the system of rice intensification (SRI). Alternate wetting and drying in SRI may lead to excessive weed growth which, if not managed in time, may cause immense loss in yield. *Echinochloa colona*, *Cyperus iria*, *Caesulia axillaris*, *Commelina communis* and *Alternanthera sessilis* were dominant weed flora. All the weed control measures were significantly effective in reducing the population of *E. colona* and *C. iria*. Lowest population of *C. iria* was recorded with the application of pyrazosulfuron + cono weeder, and it was at par with sole pyrazosulfuron, bispyribac-sodium and pretilachlor either alone or in combination with cono weeder. Cono weeder alone failed to reduce the population of *C. iria*. Fenoxaprop alone being at par with fenoxaprop + Almix and

bispyribac-sodium produced the lowest density of *E. colona*. All the weed control measures significantly reduced the total weed population and weed dry biomass over weedy field. Lowest weed density and weed dry biomass was recorded with bispyribac-sodium, followed by pretilachlor + cono weeder and fenoxaprop + Almix treatments. Bispyribac-sodium being at par with pretilachlor + cono weeder and fenoxaprop + Almix produced higher tillers per hill, effective tillers per running meter row length, seeds per panicle, 100 grain weight and grain yield of rice. Cono weeder or pyrazosulfuron or their integration gave lowest yield attributes and grain yield of rice compared to the other weed control measures. Presence of weeds throughout the growing season caused 48% reduction in grain yield.



A NEWS LETTER OF DIRECTORATE OF WEED SCIENCE RESEARCH, JABALPUR

## Identifying characters of important weed seeds

The task of identifying weed seeds is difficult due to smaller size of many seeds, loss of certain parts, differences in maturity, changes in surface appearance, etc. Identification of weed seeds with the support of color illustrations and description of seed morphological features is an easy method of weed seed identification. Some of the weed seed characters along with the seed and plant images are given below:

### 1. *Mukia maderaspatan*

Fruits ovoid, globose, green with white bands, turning red at maturity. Seeds 3-4 mm long, ovoid-oblong, grey with shallowly pitted surface.



### 2. *Polygonum plebeium*

Nutlets 1-1.5 mm long, trigonous, with persistent style, shining black.



### 3. *Spilanthes acmella*

Achenes 2-2.5 mm long, oblong-ovoid, compressed, scabrid, pappus bristles 2-3 minute.



### 4. *Stachytarpetia indica*

Fruit (drupe) pear shaped, ribbed, 3-5 mm long, enclosed in the calyx, breaking into two oblong pyrenes. Seed long 3-5 mm, black, longitudinally ribbed on one side and flat on the other side.



### 5. *Trichodesma zeylanicum*

Fruits ellipsoid, nutlets ovoid-oblong, smooth, obscurely margined, 4-5 mm long, grey-brown when ripe.



### 6. *Volutarella ramosa*

Achene 4-5 mm long, acutely angled, pitted in the grooves, dull brown, pappus hairs many, 5-16 mm long, unequal, shining brown.



### 7. *Cleome chelidonii*

Fruit a slender, erect, glandular pubescent cylindrical capsule, 4-8 cm long; seeds about 1 mm in diameter, granular, black or dark brown, transversely and irregularly grooved.



### 8. *Atylosia scarabaeoides*

Pod straight, apiculate, transversely lined between the seeds, 4-6 seeded, clothed with fine spreading brown silky hairs. Seeds oblong, 0.3-0.5 cm, dull black with grey mottling.



## News

### XX Biennial Workshop of AICRP-WC

Biennial Workshop of All India Coordinated Research Project on Weed Control (AICRP-WC) was convened at Kerala Agricultural University, Thrissur on 17-18 April, 2012. In the inaugural session, Dr. C.T. Abraham, Associate Dean, KAU, Thrissur and Principal Investigator, AICRP-WC at Thrissur centre welcomed the dignitaries and participants to the biennial workshop. Dr. P.V. Balachandran, Director of Extension, KAU in his presidential address highlighted the problems posed by aquatic weeds and weedy rice in the lowland areas of Kerala. Inaugurating the workshop, Dr. T.R. Gopalakrishnan, Director of Research, KAU emphasized the importance of herbicides in the context of scarcity of labour. Dr. A.R. Sharma, Director, DWSR presented an outline of the areas of importance in weed management research. During this session, dignitaries released some publications, viz. the Annual Report of AICRP-WC (2011-12); consolidated reports on 'Long-Term Tillage and Long-Term Herbicidal Weed Management in Different Cropping Systems, and Farm Trial and Impact analysis of Weed Management Under Different Cropping Systems' by Dr. C. Chinnusamy and co-workers. of TNAU, Coimbatore; and the technical bulletin in Telugu on "Weed-Management in Different crops" by Dr. M. Madhavi and Dr. T. Ram Prakash, ANGRAU, Hyderabad. In three technical sessions and a plenary session 97 scientists and experts from different organisations took part to yield some important recommendations. Dr. Pushpalatha, Registrar of KAU and the Chairperson of the plenary session appreciated the work being undertaken in AICRP-WC and suggested to harness the beneficial qualities of weeds. Dr. A.R. Sharma emphasized the importance of technology transfer and hoped that scientists of all the disciplines working in the project should devote at least 25% of their time for extension activities. Scientists of the project, viz. Dr. T.V. Ramchandra Prasad, Dr. S.S. Mishra, Dr. O.L. Sharma, and Dr. K.S. Yadav were given warm farewell as they will be attaining superannuation during 2012. At the end, Dr. R.P. Dubey, In-charge, AICRP-WC, proposed the vote of thanks.



### Biennial Conference of Indian Society of Weed Science

Indian Society of Weed Science in collaboration with Kerala Agricultural University, Thrissur and the Directorate of Weed Science Research, Jabalpur organized a two days conference on the theme 'Agriculture, Biodiversity and Environment' at KAU Thrissur, Kerala on April 19-20, 2012. There were three dozens of lead papers on different aspects of weed management enjoyed by more than



200 weed scientists from different corners of the country. Dr. R. D. Gautam, Principal Scientist, IARI, New Delhi was invited for the first 'Prof. Mahesh K. Upadhyay Lecture' on non-chemical weed management with special reference to *Parthenium hysterophorus*. General Body Meeting of the (ISWS) was held on April 19, 2012 at Kerala Agricultural University, Kerala. In this meeting, 125 bonafide members of the ISWS were present. At the outset, Dr. T.V. Muniyappa, the President of ISWS, urged the members to work with full zeal and enthusiasm for the progress of the Society. He hoped that after unification of the two factions, the Society will rise to newer heights. Dr. Sushilkumar, Secretary, ISWS apprised the house about activities carried out by the EC during 2011-2012. After a thorough discussion on various emerging issues related to the functioning of the Society, some important resolutions on the formation of new Executive Council were passed unanimously.

#### Institute Research Council (IRC) meeting

Meetings of IRC were conducted under the Chairmanship of Dr. A.R. Sharma, Director, DWSR on 14 and 16 June 2012. Dr. A.K. Pandey, Chairman, M.P. Private Universities Regulatory



Commission, Bhopal, and Dr. R.S. Tripathi, Former Director Research IGKV, Raipur were invited to act as resource persons. Dr. A.R. Sharma presented brief information about the Directorate, mandate / objectives, infrastructure, staff strength, and research projects undertaken during 2011-12. Dr. A.K. Pandey, in his initial remarks, stressed on the importance of bioherbicide development and biocontrol measures for managing weeds. He emphasized on integration of bioherbicides with other weed management technologies. He insisted to survey for indigenous bioagents and to explore the potential of - for management of problem weeds. Dr. R.S. Tripathy stressed upon mechanical weeding in order to minimize herbicide use. He urged for designing more implements, and testing them on farmers' fields. The research work carried out by the scientists during 2011-12 was reviewed in the meeting, and new programmes for 2012-13 were decided.

#### First meeting of the newly-constituted Institute Management Committee (IMC)

The XXI Meeting of IMC was held on June 30, 2012 at the Directorate under the chairmanship of Dr. A. R. Sharma, Director, DWSR. It was the first meeting of the newly-constituted IMC. The other members present in the meeting were Dr. A.K. Vyas, Head, Division of Agronomy, IARI; Er. S.S. Shrimali, Sr. Scientist, CSWCRTI; Dr. S.D. Upadhyay, Prof. & Head, Deptt of Forestry, JNKVV; Dr. K.K. Barman, Sr. Scientist, Soil Science, DWSR and Mr. Wajyoddin, Administrative Officer, DWSR. The special invitees of this meeting were Dr. S.C. Modgal, Chairman, QRT (DWSR & AICRP-WC); Sh. Prashant Kumar, Sr. Finance and Accounts Officer, CIAE; Dr. Anil Dixit, Pr. Scientist and I/c Asstt. Finance and Account Officer, DWSR and Dr. R.P. Dubey, Sr. Scientist and I/c AICRP-WC, DWSR. Dr. Shirma apprised the participants of the

agenda items for this meeting. He made a brief presentation on the DWSR historical background, mandate, infrastructure, staff strength, research projects undertaken, and new research programmes. Dr. S.C. Modgal, the Chairman, QRT presented the QRT report, which, after thorough discussion, was adopted by the IMC. Five programme leaders presented the salient research achievements of 2011-12, and the newly identified major research programmes. In the end, the chairman, IMC expressed satisfaction over the outcome of the meeting. He emphasized that the IMC meeting will now be held at regular intervals as per guidelines. The meeting ended with vote of thanks to the Chairman, members of IMC and special invitees.

#### Quinquennial Review Team (QRT) meeting

Two meetings of QRT was held on 1-3 May, 2012 at DWSR, Jabalpur and 16-17 May 2012 at NRCPB, IARI, New Delhi. The first draft report was prepared through a thread-bearing discussion on review reports of different visits made by the QRT to DWSR and centres of AICRP-WC. In the two-day brain-storming meeting at Delhi, the report has been finalised under the chairmanship of Prof. S.C. Modgal.



#### Dr. Nachane's talk on intellectual property

The Institute Technology Management Unit (ITMU) organized a presentation on the 'General procedure for management of intellectual property' by Dr. R. P. Nachane, Chairman, ITMU & ZTMC, CIRCOT, Mumbai, on June 12, 2012. Dr. Nachane presented the topic lucidly covering different aspects of intellectual property and intellectual property right. He narrated the three-tier intellectual property management mechanism prevalent in ICAR.



#### Research priorities of DWSR

A meeting was convened by the Director General, ICAR on 26-28 April, 2012 at NASC, New Delhi to discuss about the research priorities at DWSR. The meeting was attended by the Deputy Generals of all Divisions, Directors and Assistant Director Generals of selected disciplines, Chairman, QRT and RAC of the Directorate. The major research programmes for DWSR were identified as below.

- Weed biology, physiology and biotechnology
- Upscaling weed management in diversified cropping system.
- Improving efficiency of herbicides and other production inputs.
- Special weed problems and their integrated management.
- Herbicide residue hazards and environmental quality.
- Human resource development and transfer of technology.

## Research on *Orobanche* in Directorate's centre

Dr. S.S. Punia, Sr. Agronomist (Weed Control) and PI of AICRP-WC Hisar centre attended and presented a paper on Management of *Orobanche aegyptiaca* in mustard and tomato in North-West India during 6<sup>th</sup> International Weed Science Congress in Hangzhou, China, 17-22 June, 2012. Participants of the conference appreciated the work done on management of parasitic weed *Orobanche* in Indian mustard at CCS HAU Hisar. His research recommends that the post emergence applications of glyphosate @ 25 g/ha at 30 days after sowing (DAS) and 50 g/ha at 55 DAS, by using 375 liters of water/ha provide 60-75% control of *Orobanche aegyptiaca* in mustard crop without any crop suppression. These findings were also presented during Annual Workshop of rape-seed and mustard organized at Ranchi from 3-5, August, 2012.



## Personalia

### Awards and Recognitions

1. **Dr. A.R. Sharma**, Director was honoured with IASWC Fellow for the year 2010 by the Indian Association of Soil and Water Conservationists.
2. **Dr. R.P. Dubey**, Sr. Scientist, DWSR, Jabalpur was honoured with ISWS fellow award.
3. **Dr. A.S. Jadhav**, Agronomist, AICRP-Weed Control, MKV, Parbhani, Maharashtra was honoured with Vasant Rao Naik Agricultural Scientist Award-2012 for his outstanding contributions in weed science.

### Participation in seminars/symposia

1. Drs. A.R. Sharma, R.P. Dubey, Anil Dixit, V.P. Singh, K.K. Barman, Sushilkumar, D.K. Pandey, Shobha Sondhia, V.S.G.R. Naidu, P.K. Singh, C. Kannan, M.S. Raghuvanshi, O.N. Tiwari and Pankaj Shukla attended AICRP-WC Biennial Workshop held at KAU, Thrichur on April 17-18, 2012.
2. Drs. A.R. Sharma, Sushilkumar, R.P. Dubey, Anil Dixit, V.P. Singh, P.K. Singh, K.K. Barman, D.K. Pandey, Bhumes Kumar, P.J. Khankhane, Shobha Sondhia, V.S.G.R. Naidu, P.P. Choudhury, C. Kannan and M.S. Raghuvanshi attended the Biennial Conference of ISWS on Weed threat to Agri., biodiversity and Environment, held at KAU, Thrichur on April 19-20, 2012.
3. Dr. A.R. Sharma, Director participated in the Conference on Livelihood and Environmental Security through Resource Conservation in Eastern Region of India

(LESRC-2012) organized by IASWC at Orissa University of Agriculture and Technology, Bhubaneswar during 5-7 April, 2012. He also chaired a technical session.

4. Dr. A.R. Sharma, Director participated in Executive Development Programme on Leadership Development at NAARM, Hyderabad from 4-8 June, 2012.

### M.Sc. theses

1. Ms. Pragya Shukla, Rajiv Gandhi College, Satna on 'Phytotoxicity of East Indian Valerian (*Valeriana wollichii* DC) on aquatic weeds' under the supervision of Dr. D.K. Pandey.
2. Ms. Monika Namdeo, St Alloysius College, Jabalpur, on 'Microbial composting of weeds using *Trichoderma viride*' under the supervision of Dr. C. Kannan.
3. Ms. Sonakshi Verma, St Alloysius College, Jabalpur, on 'Microbial fermentation of water hyacinth- A lignocellulosic source for the production of bioethanol' under the supervision of Dr. C. Kannan.
4. Mr. Abhishek Mishra, Dr. DY Patil College of Biotechnology and Bioinformatics, Pune, on 'Assessment of salt tolerance of *Sorghum helepense*' under the supervision of Dr. Bhumes Kumar.
5. Mr. RishiRaj Khare, College of Agriculture, JNKVV, Jabalpur, on 'Evaluation of cyhalofop-p-butyl leaching in soil and its effect on physico-chemical properties of soil and water' under the supervision of Dr. S. Sondhia.
6. Mr. Little Kumar Prajapati, Rajiv Gandhi College, Satna on 'Studies on the enzyme pattern of chickpea upon infected with *Cuscuta campestris*' under the supervision of Dr. C. Kannan.
7. Ms. Urvashi Yadav, Govt. M. H. Autonomous College of Home Science and Science for Women, Jabalpur on 'Identification of sulfosulfuron-degrading fungi and fungal degradation of the herbicide in soil and media' under the supervision of Dr. P.P. Choudhury
8. Ms. Shivani Pare, St. Aloysius College, Jabalpur on 'Identification of sulfosulfuron-degrading fungi and fungal degradation of the herbicide in water' under the supervision of Dr. P.P. Choudhury

### Farewell

- Dr. V.S.G.R. Naidu, Sr. Scientist (Economic Botany) DWSR, was relieved on 21.05.2012 to join as Programme Coordinator, KVK, Rajahmundry, Andhra Pradesh.

### Distinguished visitors

- Dr. A.K. Pandey, Chairman, M.P. Private Universities Regulatory Commission, Bhopal on June 14, 2012
- Dr. R.S. Tripathi, Former Director Research IGKV, Raipur on June 15, 2012

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