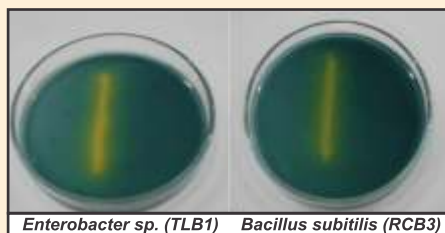


RESEARCH HIGHLIGHTS

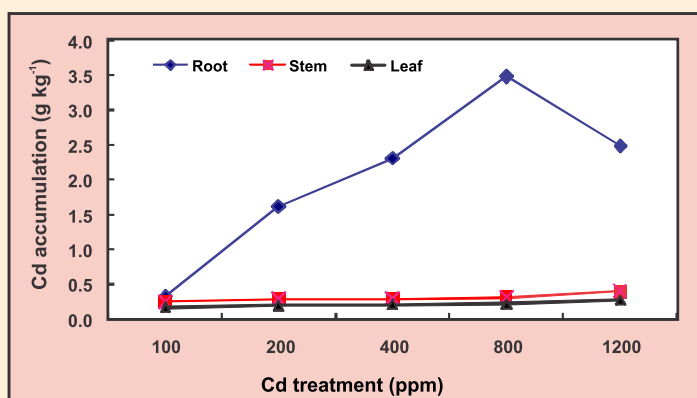
Siderophore Production by Bacteria Associated with Weedy Plants

Siderophores are produced by rhizosphere bacteria to solubilize unavailable forms of heavy metal bearing minerals by complexation. Soil and plant samples were collected from different heavy metals contaminated areas of Jabalpur district. Based on their predominance in each region, a total of 9 different weed species viz., *Typha latifolia*, *Rumex crispus*, *Ageratum conyzoides*, *Chenopodium album*, *Eichhornia crassipes*, *Ammannia auriculata*, *Sida acuta* and *Cyperus rotundus* were sampled. Plant growth promoting rhizobacteria were isolated using serial dilution technique on King's B medium and were screened for tolerance to various heavy metals. The formation of bright zone with yellowish fluorescent colour by the culture in the dark colour medium indicated siderophore production. The isolates with positive plate assay were further analyzed by Arnow assay for the detection of catechol-type siderophore. Among 58 rhizosphere isolates, 10 were able to produce siderophore. The maximum siderophore production was recorded in *Enterobacter* sp. (TLB1) ($66.30 \pm 3.21 \mu\text{g mg}^{-1}$ protein) followed by *B. subtilis* (RCB3) ($54.6 \pm 2.14 \mu\text{g mg}^{-1}$ protein).



Cadmium Uptake by *Arundo donax*: Implications for Enhanced Phytoremediation

In a pot experiment, potential of *Arundo donax* was tested for cadmium (Cd) tolerance and for efficiency of Cd removal. Different cadmium concentration ranging from 0 to 1200 mg/L with EDTA supplementation @ 0, 3 and 6 ppm were applied to the pots. No adverse effect of cadmium levels was found on height and chlorophyll reflectance by leaves of *Arundo donax*. Among plant parts, maximum cadmium accumulation was observed in root followed by stem and leaves. Supplementation of EDTA @ 3 and 6 ppm enhanced cadmium accumulation in root as compared to control suggesting that EDTA can substantially enhance the efficiency of Cd removal.



Accumulation of Cd in different part of Aundo donax

NEWS

Visits of Farmers at DWSR

A total of 2367 farmers from 15 districts of Madhya Pradesh visited DWSR during July to September, 2014. During their visits, various improved practices of weed management in different *Kharif* crops were demonstrated at Directorate. Team of experts led by Dr P.K. Singh interacted with farmers and shared their view on various aspects of weed management in *Kharif* crops.



Celebration of Independence Day

Directorate celebrated Independence Day. On the occasion, The Director hoisted the National flag and addressed the gathering. He recalled great contributions made by the freedom fighters for independence of the nation and also briefed about contribution made at DWSR in research and development and future challenges to be addressed. On the occasion of Independence Day, staff of DWSR participated in mass plantation programme and planted teak saplings in DWSR campus. It was decided that saplings will be looked after only by the concerned staff member and also named after them.



Workshop-cum-training Programme on *Parthenium* Management

Gram Jan Vikas Samiti and Eco Vikas Samiti organized a workshop-cum-training programme on 25 August, 2014 for *Parthenium* management at village Garhi of Tehsil Behar in district Balaghat. Dr Sushil Kumar and Dr P.K. Singh from DWSR gave training on *Parthenium* management to stakeholders. On this occasion, about 25 thousand beetles were distributed to participants representing different villages with the appeal to release the bioagents in their respective area for eco-friendly biological control of *Parthenium*.

Training on Biological Control of *Parthenium* in Punjab

On the request of Project Director, ATMA, Patiala (Punjab), a two days training programme on "Biological Control of *Parthenium*" was organized during 28-29 August, 2014. Dr Sushil Kumar



imparted training to the staff of Agriculture Department and farmers from nearby villages of district Patiala. Programme was inaugurated by the District Collector, Patiala and co-ordinated by Project Director, ATMA, Patiala. During the programme, about 20,000 beetles were distributed to farmers representing different villages.

Visit of Dr A.K. Sikka, DDG (NRM)

Dr A.K. Sikka, Deputy Director General, Natural Resource Management (NRM), ICAR, New Delhi, visited DWSR on 3 September, 2014 accompanied by Dr S.K. Patil, Vice Chancellor, IGKV, Raipur. Dr A.R. Sharma, Director DWSR welcomed dignitaries. DDG discussed various issues and took an account of progress of scientists in respect to their research work and other assignments.



Review Meeting of National Fund Project

Review Meeting of National Fund Project "Study of domestication traits of two weed species" was held on 6 September, 2014 under the chairmanship of Professor C.R. Babu. Professor R. Geeta (Member Advisory Committee), Dr A.R. Sharma (Director, DWSR), Principal Investigators from co-operating centres, Co-investigators from DWSR, Administrative Officer, AF&AO and other project associates participated in the meeting. Dr Bhumesh Kumar, Principal Investigator, presented the finding of the research work followed by presentations made by scientists from co-operating centres. The committee critically discussed the details and progress made during last year and made recommendations for further improvement.



Participation in ICAR Zonal Sport Meet at Nagpur

Sports contingent of DWSR consisting of 22 players led by Dr Bhumesh Kumar (Chief-de-Mission) participated in ICAR Zonal Sports 2014 (Central zone) held at NBSS & UP, Nagpur during 16-20 September, 2014. DWSR participated in 11 individual and 4 team events. Dr Meenal Rathore (Shotput-Women) and Sh. Veer Singh (Carom-Men) won first positions. Dr Meenal Rathore also won second position in Discus throw-Women. In addition, DWSR teams reached into semi final in Kabbadi. During closing ceremony, ICAR flag was handed over to Chief-de-Mission, DWSR as next ICAR Zonal sports meet will be organized by DWSR, Jabalpur in 2015.



हिन्दी पखवाड़े का आयोजन

निदेशालय में राजभाषा कार्यान्वयन समिति द्वारा दिनांक 16 से 30 सितम्बर 2014 तक हिन्दी पखवाड़े का आयोजन किया गया। जिसमें कार्यालय के समस्त अधिकारियों/कर्मचारियों ने सक्रिय रूप से भाग लिया।



पखवाड़े के दौरान निदेशालय में आलेखन एवं टिप्पण, शुद्धलेखन, विवज प्रतियोगिता का आयोजन किया गया। पखवाड़े के समापन अवसर पर कवि सम्मेलन का भी आयोजन किया गया। जिसमें जबलपुर के प्रख्यात कवियों ने भाग लिया और अपनी प्रस्तुती दी। इस अवसर पर विभिन्न प्रतियोगिताओं में जीतने वाले प्रतिभागियों को पुरस्कारों से सम्मानित किया गया। डा. पी.पी. चौधरी ने हिन्दी पखवाड़े के समापन समारोह में धन्यवाद प्रस्ताव प्रस्तुत किया।

Training on Parthenium Management to NSS Students

Dr Sushil Kumar imparted training to students of National Service Scheme in a workshop on "Parthenium Eradication" organized by District Unit of NSS on 20 September, 2014 at Shri Janki Sharan Mahavidhyalaya, Jabalpur. The aim of the workshop was to make NSS students aware about the problem and management of *Parthenium*. After the workshop, all *Parthenium* was uprooted from the college campus.



Farmers' Field Visit

Field visits were organized at Sihora, Panagar and Ragartola (Khukham) localities on 22-23 September, 2014 to review the progress of ongoing on farm research trials. Director and other scientists participated in field visits. During visit, scientists *vis-a-vis* farmers shared their views on various issues related to weed management. Director extended knowledge-based support to the farmers and encouraged them to adopt improved weed management practices.



Cleanliness Drive at DWSR

Under the Swachh Bharat Mission of Central Government of India, special cleanliness drive was launched at DWSR on 25 September, 2014. Dr A.R. Sharma, Director, DWSR motivated the staff members for their contribution in making the campus clean. All the staff members were given responsibility to clean the identified places within the premises. Staff members participated in the cleanliness campaign with enthusiasm and cleaned the corridors, floors, basement, parking area, lawn and farm roads of the campus. On the occasion of Gandhi Jayanti, all the staff members again cleaned the different adjoining areas outside the campus and also motivated the local people for their contribution in Swachh Bharat Mission.



Meeting of Institute Management Committee

Meeting of the XXIII Institute Management Committee (IMC) was convened on 27 September, 2014 under the chairmanship of Dr. A.R. Sharma, Director, DWSR. Other members who attended the meeting were Dr A.K. Vyas, Assistant Director General (HRD), ICAR, New Delhi; Sh. B.P. Tripathi, Joint Director, DFWAD, Govt. of M.P., Bhopal; Dr S.S. Tomar, Director



Research Services, JNKVV, Jabalpur; Professor S.D. Upadhyay, JNKVV, Jabalpur; Dr Prem Kishore, Chief Editor, Crop Care & Vice President, Cristal Crop Protection Pvt. Ltd., New Delhi. The Chairman, IMC welcomed all members of IMC and special invitees, and briefed about the institutes activities. Discussion on other agenda items, viz. budget and status of works and equipments proposals was also held. The members visited research farm and laboratories and appreciated the work being done at DWSR.

Visit of Secretary, DARE & DG, ICAR

Dr S. Ayyappan, Secretary, DARE & Director General, ICAR visited the Directorate on 29 September, 2014. Dr V.S. Tomar, Vice Chancellor, JNKVV, Jabalpur and Dr. Anupam Mishra, Director, ZPD, Zone VII also accompanied him. Dr A.R. Sharma, Director DWSR welcomed all the dignitaries. Dr Ayyappan had a brief informal interaction meeting with scientists and staff of the Directorate. He also visited field experiments being conducted at the Directorate.



Publication Released

Dr S. Ayyappan, Secretary, DARE & Director General, ICAR released a Silver Jubilee Publication of the Directorate "DWSR: Marching Ahead". He appreciated and congratulated the editorial team for their sincere efforts.



Visit of ADG (NFBSFARA)

Dr Pawan Kumar Agrawal, Assistant Director General (ADG), National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA) visited DWSR on 30 September, 2014 to monitor the projects work being carried out at DWSR, Jabalpur. He interacted with respective project teams, visited the laboratories and field experiments and discussed various issues related to ongoing research programme with concerned Principal Investigators.



Forthcoming Book

A new reference-cum-textbook entitled "Transgenic Herbicide Resistance in Plants" will be available soon for the readers. This book has been written by Dr V.S. Rao, eminent weed scientist and author of landmark book "Principles of Weed Science" The book published by CRC Press (a division of Taylor & Francis) provides a comprehensive and in-depth discussion on the development of herbicide resistance, emphasizing the biochemical pathways of

herbicide resistance in weeds. This book, now in press, is expected to be available in December 2014 in India. Dr Rao's current mailing address is: 10113 Waterfield Drive, ELK GROVE, California 95757, USA, Email: dr_vs_rao@yahoo.com

PERSONALIA

Award

Crystal National Agri Award, 2014 was conferred to Dr Sushil Kumar, Principal Scientist (Entomology) under the Research Scientist category for his outstanding work on *Parthenium* Management by Krishi Anusandhan & Kisan Vikas Foundation, New Delhi on 27 August, 2014. The Award was given by Shri Radha Mohan Singh, Hon'ble Agriculture Minister, Government of India and Shri Nitin Gadkari, Hon'ble Minister of Transport & Rural Development, Government of India.



Participation in Trainings

- Dr V.P. Singh attended Pre-RMP training programme on "Leadership Development" at NAARM, Hyderabad during 15-26 July, 2014.
- Drs P.P. Choudhury, Bhumesh Kumar, Raghwendra Singh, Meenal Rathore attended "Refresher Course on Agricultural Research Management" at NAARM, Hyderabad during 14-26 July, 2014.
- Dr R.P. Dubey attended "Workshop on PME" at NAARM, Hyderabad during 4-8 August, 2014.

Participation in Conferences/Workshop/ Meetings

- Drs Bhumesh Kumar and Meenal Rathore attended National Seminar on "Technologies for Sustainable Production through Climate Resilient Agriculture" during 8-9 August, 2014 at JNKVV, Jabalpur.
- Dr V.P. Singh attended Regional Workshop on strengthening AICRP-WC, Jabalpur and AICRP-IFS Modipuram running in U.P., Uttarakhand, Haryana, H.P. and Punjab on 11 August, 2014 organized at CCSHAU, Hisar.
- Drs A.R. Sharma, Sushil Kumar and Mr. Sandeep Dhagat attended meeting for presentation of EFC proposal during 14-15, August, 2014 at ICAR, New Delhi.
- Drs P.K. Singh and R.P. Dubey participated in "State Level Workshop on Agriculture and Horticulture" on 30-31 August, 2014 at JNKVV, Jabalpur.
- Drs P.K. Singh, K.K. Barman and P.J. Khankhane attended the "National Conference on Soil Health: A Key to Unlock and Sustain Production Potential" during 3-4 September, 2014 at JNKVV, Jabalpur.
- Drs P.K. Singh and V.P. Singh, attended "XXI Zonal Workshop for Scientists of KVKs, Zone VII during 5-7 September, 2014, at IGKV, Raipur.
- Dr A.R. Sharma attended "Special Convocation of IARI" on 8 September, 2014 at ICAR New Delhi.
- Drs Bhumesh Kumar, Meenal Rathore and Niraj Tripathi participated in "National Conference on Biotechnology for Sustainable Agriculture" during 8-9 September, 2014 at JNKVV, Jabalpur.
- Dr Sushil Kumar participated and delivered lecture in the workshop on "Parthenium management" on 10 September, 2014 held at Raja Mansingh Tomar Music & Arts University, Gwalior organized by Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Gwalior.
- Dr A.R. Sharma participated in Selection Committee meeting for recruitment of faculty positions on 15 September, 2014 at IIT, Kharagpur.
- Drs P.K. Singh and Raghwendra Singh participated in "Field

Level Orientation Programme for Tribal Farmers” on 15 September, 2014 organized by SRIDA Centre, Jabalpur at Ramanpur (Bargi Block).

- Dr A.R. Sharma delivered lecture on weed management in the “Workshop on IPM” on 16 September, 2014 organized by NCIPM, New Delhi at Puduchery.
- Drs P.K. Singh, V.P. Singh, Sushil Kumar, R.P. Dubey, Raghwendra Singh, Bhumes Kumar and Mr Mukesh Meena participated in “Farmer’s Fest” on 29 September, 2014 at BISA, Jabalpur.

Students' Seminars

- Ms Ankita Pathak, M.Sc student of Dr K.K. Barman presented her thesis seminar on “Effect of pendimethalin on growth of *Azotobacter* in sesame (*Sesame indicum* L.) rhizosphere” on 16 August, 2014.
- Mr Sourabh Pagare, Ph.D student of Dr Bhumes Kumar presented his synopsis seminar on “Physiological and molecular characterization of *Physalis* species” on 16 August, 2014.
- Mr Jonathan Alferedo Lopez Colon, M.Sc student from University of Metropolitana, San Juan, USA presented his deputation work done under supervision of Dr Shobha Sondhia on “Biodegradation of mesosulfuron by soil fungi” on 16 August, 2014.

Director's Meetings with Scientists

- Monthly Director-scientists' meeting was held on 2 August, 2014 to discuss various research issues and other ongoing assignments.

Guest Lectures

- Dr M.D. Reddy: “Agriculture development in Telangana” on 1 August, 2014.
- Dr D.K. Benbi: “Carbon sequestration and soil health” on 4 September, 2014.

Technical Seminars

- Dr C. Sarathambal: “Bioprospecting of weed rhizosphere” on 4 August, 2014.

- Drs V.P. Singh, R.P. Dubey, P.P. Choudhury, Bhumes Kumar, Raghwendra Singh and Meenal Rathore presented their experience of trainings attended at NAARM, Hyderabad on 20 August, 2014.

Visitors

- Dr M.D. Reddy, Ex-Dean, WTC, ANGRAU, Hyderabad on 1 August, 2014.
- Dr O.P. Singh, President, Danuka Agritech Ltd., New Delhi on 17 August, 2014.
- Dr Samresh Diwivedi, Principal Scientist, ITC LSTC, Hyderabad on 23 August, 2014.
- Dr A.K. Vyas, Assistant Director General (HRD), ICAR, New Delhi on 27 August, 2014.
- Dr A.K. Sikka, Deputy Director General (NRM), ICAR, New Delhi on 3 September, 2014.
- Dr D.K. Benbi, National Professor, PAU, Ludhiana on 4 September, 2014.
- Dr C.R. Babu, Professor Emeritus & Ex-Pro-Vice Chancellor, Delhi University, New Delhi on 6 September, 2014.
- Dr R. Geeta, Professor Botany, Delhi University, New Delhi on 6 September, 2014.
- Dr S. Ayyappan, Secretary, DARE & Director General, ICAR, New Delhi on 29 September, 2014.
- Dr P.K. Agrawal, Assistant Director General (NFBSFARA), ICAR, New Delhi on 30 September, 2014.

Farewell

- Er H.S. Bisen, Principal Scientist (Agricultural Engineering) sought voluntary retirement from service on 31 August, 2014.



- Dr A.R.G. Ranganatha, Project Coordinator, AICRP on Sesame & Niger (and former acting Director, DWSR) completed his tenure on 22 October, 2014 and rejoined Directorate of Oilseeds Research, Hyderabad.



From Director's Desk



I feel privileged to present the third issue of 'Weed News' highlighting the activities undertaken by the Directorate during third quarter of 2014. Dr S. Ayyappan, Secretary, DARE & Director General, ICAR, visited the Directorate on 29 September, 2014 and released a publication “DWSR: Marching Ahead”. Dr A.K. Sikka, DDG (NRM); Dr Pawan Kumar Agrawal, ADG (NFBSFARA); Dr A.K. Vyas, ADG (HRD); Dr S.K. Patil, Vice Chancellor, IGKV, Raipur and other distinguished personalities visited Directorate during this period. Directorate celebrated Independence Day on 15 August, 2014, and to mark the occasion in a unique way, staff of DWSR participated in mass plantation programme and planted teak saplings within campus. Like every year, Hindi fortnight was organized from 16-30 September, 2014 during which different competitions and events were held. Meeting of the XXIII Institute Management Committee (IMC) was convened on 27 September, 2014, and finalized various budgetary and purchases issues. Sports contingent of DWSR consisting of 22 players participated in ICAR Zonal Sports 2014 (Central zone) held at NBSSL&UP, Nagpur during 16-20 September, 2014 and won positions in three events. Under the 'Swachh Bharat Mission' of Central Government, cleanliness drive has been launched at DWSR on 25 September, 2014 during which all staff members participated in different cleaning operations within the campus. On the occasion of Gandhi Jayanti, all the staff members cleaned the adjoining areas outside the campus and also convinced the local people for their contribution in 'Swachh Bharat Mission'.

We are committed to serve the farmers of this country. A total of 2367 farmers from 15 different districts of Madhya Pradesh visited DWSR and interacted with team of experts on various aspects of weed management. In addition, field visits were organized to review the progress of ongoing on-farm research trials and to have interaction with farmers. Various workshop-cum-training programmes were organized to create awareness on *Parthenium* management. In recognition of outstanding work on *Parthenium* management, 'Crystal National Agri Award, 2014' was conferred upon Dr Sushil Kumar, Principal Scientist (Entomology) by Krishi Anusandhan & Kisan Vikas Foundation, New Delhi on 27 August, 2014.

The Directorate has continued to make excellent progress in weed science research, extension and training activities. Despite, aberrant weather conditions, the entire areas was cropped this time and all sowings/plantings were completed by the first week of August, 2014. Encouraged by the results of CA-based practices during *Rabi* and summer season crops, this time large area was covered under zero-till rice which showed excellent crop performance. This practice will be intensified further for reducing cost, increasing profitability and developing sustainable crop production system.

Editorial Team: Dr. Sushil Kumar, Dr. Bhumes Kumar, Dr. Raghwendra Singh, Dr. Meenal Rathore and Mr. Sandeep Dhagat

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