WEED news

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From Director's Desk

Global climate change is expected to alter many elements of the future crop production. Atmospheric CO_2 concentration and average temperature will be higher, droughts and climatic extremes will be more frequent and severe in coming years. In comparison to crop, associated weeds in a given cropping system may have better adaptability to the changing environment by virtue of greater genetic diversity and climate resilience. Evidences indicate that some weed species respond more strongly to increase in atmospheric CO_2 and temperature with respect to physiology. Hence, studies on effects of increased temperature and elevated CO_2 on crop-weed interaction are frontline researchable avenues for the scientists. Increase in temperature, atmospheric greenhouse gases, and inter-species competition involving crop and weeds for land and water resources will have multiple impacts on the cropping system globally and more so in developing countries like India. Hence, it is imperative to study effects of futuristic climate change conditions (especially elevated CO_2, temperature and water deficit) on the important cropping system with emphasis on crop-weed interaction, weed dynamics and modeling for weed abundance, and of course yield losses to make precise decision with respect to policy making. Equally important is to find out factors responsible for behaviour of weed species under climate change conditions which definitely will complicate the weed management due to increase in invasiveness and weed shifts under futuristic climate change scenario.

Our Directorate has excellent facilities for undertaking research work on crop-weed dynamics under changing climate e.g. OTCs, FACE, containment chambers, etc. Accordingly, we have launched a major research programme on weed dynamics and management in the context of climate change. We are confident that collective efforts of multi-disciplinary team of our scientists involving Plant Physiologist, Molecular Biologist, Agronomist, Soil Scientist, Entomologist and Plant Pathologist will result in high quality research output in the coming years.

Research notes

UAS, Bengaluru Centre of AICRP-WC finds an exotic weed species

Ambrosia psilostachya DC is reported to have been observed for the last 15–20 years in Muniyuru Bevinahally, Turuvekere Taluk, Tumkur District. Ths is a new weed to this region, and is showing infestation of invasive nature in waste lands, road sides, plantations, field crops and forest areas. It resembles *Parthenium* in leaf structure. It is erect with less than 2 feet height, sessile leaves, opposite at the base, alternate at the top, lanceolate with pinnate toothed-blunt ends, branched upper-half of the plant, each branch or stem terminate with inflorescence - a spike, 6 to 12 inches long. Plant is monoecious with staminate (male) flowers at the top (spike) and pistillate heads (female) at the leaf axils. This weed propagates through roots and covers the entire land. The root system grows up to 9 to 12 inches. Plant can be uprooted and even shallow cultivation can remove the weed from the land. The root fragments left in the soil sprout and the plants start re-establishing. The weed does not allow other plants including grasses to grow nearby. Now, it has been reported to cover to more than 100 acres.

Management: Contamination of soil with root fragments from infested area through cultivator or plow should be avoided. Spraying glyphosate 41% SL 10 to 15 ml/liter of water or glyphosate 71% WP 10 g/liter of water or glyphosate 41% SL 10 ml/liter of water + 2,4-D sodium salt 80% WP 2 g/liter of water has shown a complete top-kill. Further work is in progress.

Ambrosia psilostachya

Closer view of Ambrosia weed – young plant - leaf – lanceolate with widely spaced pinnate lobes – blunt points, plant is erect, terminate with inflorescence

Growing *Sesbania* in rice and berseem in wheat for weed suppression

Encouraging results on weed suppression in organic rice-wheat system by growing sesbania in rice followed by its mechanical incorporation at 30 DAS; and intercropping berseem for fodder in wheat have been obtained at DWSR from long term experiments. In rice, the effect on weed suppression due to sesbania incorporation was comparable to stale-bed *fb* reduced spacing, mechanical weeding, herbicide application alone, and herbicide + hand weeding. Similarly, the grain yield of rice with this practice was comparable with 2 hand weeding, herbicide application alone and herbicide + hand weeding. In subsequent wheat crop, growing berseem for fodder had comparable effects on weed suppression with hand weeding and herbicide application alone. Similarly, the wheat yield with this practice was comparable with 2 hand weeding and herbicide + hand weeding. This weed management practice may be helpful in minimizing herbicide use and also for organic rice and wheat production.

Treatments	Weed dry biomass (g/m²)*		Seed yield (t/ha)	
	Rice	Wheat	Rice	Wheat
FYM + Stale seed bed *fb* HW	2.8 (9)	3.5 (12)	2.36	2.03
FYM + Stale seed bed *fb* reduced spacing (15 cm)	4.4 (19)	4.6 (21)	1.86	2.34
FYM + Sesbania incorporation 30 DAS	6.2 (39)	1.8 (3)	3.87	4.08
FYM + Mechanical weeding	8.3 (70)	2.8 (8)	2.15	2.56
FYM 10 t/ha + 2 hand weeding	2.1 (4)	1.5 (1.7)	3.85	4.19
Recommended NPK + Herbicide	5.5 (30)	1.9 (3)	3.91	4.84
50% FYM + 50% NPK+ Herbicide *fb* hand weeding	5.0 (26)	0.7 (0)	4.08	4.09
Control	10.5 (117)	4.1 (16)	1.35	1.74
LSD (P=0.05)	1.8	0.8	0.29	0.49

*Weed data sq. root transformed, original values are in parenthesis

Herbicidal activity of *bantulsi* on aquatic weeds

The *bantulsi* (*Croton bonplandianum* Baill) is largely known for its medicinal properties and for anti-tumor, insecticidal, insect repellent, antimicrobial and allelopathic activity on terrestrial plant species. This Directorate explored the scope of it in water hyacinth (*Eichhornia crassipes*) management. The *bantulsi* leaf powder promoted growth of water hyacinth up to 0.1% (dry w/v) but killed the weed at 0.50% in about 10 days. At the inhibitory concentration (0.25%) of leaf residue, the water hyacinth plants became flaccid followed by death and decay. The stem residue promoted growth of water hyacinth up to 0.5% but was lethal at and above 0.75%. In both the cases, the phenolic constituents decreased with time after treatment. Phenolic constituents may be responsible for the herbicidal activity.

News

Nationwide celebration of '*Parthenium* Awareness Week'

A nation-wide '*Parthenium* Awareness Week' was organized by this Directorate during August 16-22, 2012 by involving SAUs, KVKs, ICAR Institutes, centres of AICRP-Weed Control, many NGOs, municipalities, schools and colleges. The objective of this programme was to educate the farmers and general public about the ill effects of *Parthenium* and ways to manage it. To facilitate the event, posters and extension materials especially developed for this occasion were distributed to nearly 1000 organizations throughout the country with an appeal to develop more such material in regional languages and distribute among stakeholders. Institutes were involved in organising various activities like awareness, lectures, photo exhibitions, farmers' meetings, students' rallies, demonstrations on *Parthenium* management.

हिन्दी पखवाड़ा

दिनाँक 14 सितम्बर, 2012 को निदेशालय के सभागार में हिन्दी दिवस का आयोजन किया गया। कार्यक्रम का उदघाटन निदेशक महोदय डॉ. अजीत राम शर्मा द्वारा सरस्वती पूजन एवं दीप प्रज्जवलित कर किया गया। इस अवसर पर उन्होने हिन्दी की उपयोगिता एवं महत्व को बताते हुये कहा कि हमारा देश कृषि प्रधान देश है एवं अगर हमारे द्वारा की गई खोज एवं अन्य साहित्य हिन्दी में प्रकाशित किया जायेगा तो इससे अधिक से अधिक किसान भाई एंव जनसाधारण को फायदा पहुँच सकेगा। राजभाषा कार्यान्वयन समिति के अध्यक्ष डॉ. व्ही.पी. सिंह ने कार्यालय के सभी अधिकारियो/कर्मचारियों का स्वागत किया और हिन्दी दिवस के महत्व पर प्रकाश डाला।

दिनाँक 22 सितम्बर, 2012 निदेशालय के सभागार में हिन्दी पखवाड़ा समापन समारोह का आयोजन किया गया। समापन समारोह के दिन क्विज कांटेस्ट प्रतियोगिता एवं वाद–विवाद प्रतियोगिता का आयोजन भी किया गया जिसमें निदेशालय के अधिकारियों एवं कर्मचारियों ने बढ़चढ़ कर हिस्सा लिया एवं अपने विचार प्रस्तुत किये। समापन समारोह में राजभाषा कार्यान्वयन समिति के अध्यक्ष डॉ. वी. पी. सिंह ने पखवाड़े के दौरान आयोजित गतिविधियों की समीक्षा सभा के सम्मुख प्रस्तुत किया। इस अवसर पर कार्यक्रम के मुख्य अतिथि श्री नरेंद्र कुमार शर्मा जी ने अपने उद्बोधन में कहा कि आज भी हिन्दी को वह स्थान नही मिला जिसकी अधिकारी वह है हमें सहृदय होकर हमारी देश की जनभाषा, हमारी अपनी राजभाषा को अपने निजी कार्यों से लेकर कार्यालय के कामकाज में लाने का संकल्प लेना होगा तभी राजभाषा हिन्दी को उसका सम्मानीय स्थान मिल सकेगा । निदेशालय के निदेशक डॉ. अजीत राम शर्मा जी ने अपने उद्बोधन में कहा कि भा.कृ.अनु. परिषद के प्रत्येक कार्यालयों में हिन्दी पखवाड़े का आयोजन किया जाता है इस कार्यक्रम का उद्देश्य केवल हिन्दी का प्रयोग करना नही है बल्कि इसे दैनिक कार्यालयीन उपयोग में भी लाया जाना है। अंत में राजभाषा कार्यान्वयन समिति के सचिव श्री जी.आर. डोंगरे जी ने सभी का आभार व्यक्त किया ।

Personalia

Awards and Recognition

1. Dr. Sushilkumar received the prestigious 'Swami Sahajanand Saraswati Outstanding Extension Scientist Award 2011' on the 84th Foundation Day of ICAR. Dr. Sushilkumar carried out research and extension work in the field of biological control of Parthenium, a problematic weed. He developed cost effective and sustainable techniques for the mass multiplication of bioagent *Zygogramma bicolorata* and distributed the live-bioagent throughout the country. The biological control helped in suppression of Parthenium and helped other vegetation to restore in the large area on sustainable basis.

2. Sh. Veer Singh and Sh. S.K. Bose became champions in carom and chess events, respectively in the annual sports of ICAR-Central Zone held at IARI, New Delhi during September 26-30, 2012. Dr. Bhumesh Kumar and Sh. Nemichand secured third position in sort-put and 100 m sprint, respectively. Sh. Mohan Dubey secured third in two track events, 400 m and 1500 m.

3. Dr. A.R. Sharma delivered a lecture on 'Weed management in conservation agriculture system' in summer school on 'Resource conservation technologies for soil health security' held at PDKVV, Akola on September 10, 2012.

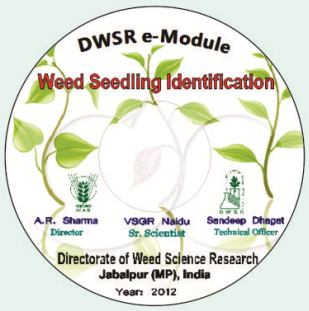
Participation in seminars/symposia and training

1. Dr. V.P. Singh attended the training programme on 'Consultancy Projects Management' held at NAARM, Hyderabad during August 7-14, 2012.
2. Dr. A.R. Sharma attended the 'Knowledge Meet' of Vice Chancellors of SAUs ad Directors of ICAR Institutes held at NASC, New Delhi during August 21-22, 2012.
3. Dr. Yogita Gharde attended the training programme on 'Forecast modeling in crops using weather and geo-informatics' held at IASRI, New Delhi during August 22 - September 4, 2012.
4. Mr. K.K. Tiwari attended the 9th Advanced Level Training in 'Soil testing, plant analysis and water quality assessment' organized at the Division of Soil Science and Agricultural Chemistry, IARI, New Delhi during September 4 - 24, 2012.
5. Dr. P.P. Choudhury attended the ICAR sponsored short course on 'Application of nanotechnology in soil science and plant nutrition research' held at IISS, Bhopal during September 18 - 27, 2012.

Publications

e-Module on 'Weed Seedling Identification'

This database 'Weed seedling Identification' was published by the Directorate to help in identifying the weeds at early stages to manage them effectively and economically. In this e-module the user can search/query by the scientific name (in alphabets), or by viewing the seedling cotyledon shapes thumbnail. User can select the requisite image or name of weed seedling to retrieve the data of that species with all identification characters.



M.Sc. theses

1. Ms. Ruby Singh, St. Aloysious College, Jabalpur on 'Effect of metribuzin on physiological, nodulation and biochemical parameters of pea (*Pisum sativum*) Var. JP 885 and VRP7' under the supervision of Dr. Meenal Rathore
2. Ms. Hemlata Yadav, A.P.S University, Satna on 'Extraction of macromolecules and their electrophoresis' under the supervision of Dr. Meenal Rathore
3. Ms. Smita Rajput, Mata Gujri Mahila Mahavidhyalaya, Jabalpur on 'The role of soil fungus in the enhanced biodegradation of penoxsulam' under the supervision of Dr. Shobha Sondhia
4. Ms. Neeti Shukla, Rani Durgavati University, Jabalpur on 'Bioethanol production from water hyacinth using yeast' under the supervision of Dr. C. Kannan
5. Ms. Shilpa Kaurav, Rani Durgavati University, Jabalpur on 'Exploitation of native fungal pathogens for the biological management of water hyacinth (*Eichhornia crassipes*)' under the supervision of Dr. C. Kannan
6. Ms. Uzma Waseem, Mata Gujri Mahila Mahavidhyalaya, Jabalpur on 'Enhanced biodegradation of an acetolactate synthase (ALS) inhibitor pyrazosulfuron herbicide in agricultural soil by soil fungi' under the supervision of Dr. Shobha Sondhia
7. Mr. Virendra Kakotiya, JNKVV, Jabalpur on "Influence of soil organic matter in the phototransformation of pretilachlor, an acetanilide herbicide" under the supervision of Dr. P.P. Choudhury
8. Mohammad Rasid Khan, JNKVV, Jabalpur on 'Impact of weed management practices on soil health indicators in a mango orchard with and without intercropping' under the supervision of Dr. K. K. Barman

Technical Seminar

1. Dr. Sushilkumar: 'Aquatic weed problem and their management in India' on 28.07.2012
2. Dr. Anil Dixit: 'Herbicide tolerance crops' on 31.08.2012

Farewel

- Mr. Wazuddin, AO, DWSR, retired voluntarily from his job on August 23, 2013.

Distinguished visitor

- Dr. N. F. Almubarak, College of Agriculture, University of Diyala, Iraq on 20.09.2012

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