ISWS News Letter
A publication of Indian Society of Weed Science
January – June 2013

MESSAGE FROM THE PRESIDENT

Weed management in India is highly labour intensive. It has been estimated that about 5 billion man-days of labour is required annually for weeding operations. Unfortunately, it is the women who are mostly involved in this back-breaking activity. From the farmers point of view, the increasing labour costs has made the weeding management uneconomical. Further, the labour availability to agriculture in general has become very scarce over the years, courtesy some of the welfare measures of the Central Government such as the MNREGA. In this context, popularizing the use of herbicides will be the most practical approach in this non-chemical methods of weed management. Further it enhances the adoption of resource conservation and sustainable technologies such as reduced/zero tillage and conservation agriculture. Conservation agriculture (CA) has emerged as a new way forward to achieve the goals of sustainable agriculture in response to the new challenges such as widespread resource degradation, need to reduce production cost, increased profitability and making agriculture more competitive and sustainable. With the expected increased use of herbicides for weed management, weed scientists have a big challenge before them in sensitizing and building capacity of extension personnel in the safe and judicious use of herbicides. Despite years of training, there is lack of knowledge with the extension personnel. It is critical to impress them that use and application of herbicides is not the same as use of other pesticides. It is also pertinent to sensitize the senior managers and policy makers about the safety of food harvested from fields treated with herbicides. It is often talked in the context similar to pesticide residues at harmful levels that are frequently encountered with the use of insecticides. It is necessary to impress all stakeholders of the difference in inherent toxicity levels (higher LD50 values) and the wide gap between application of herbicides and harvesting of the crops. Herbicides are inherently less toxic and are applied at the time of planting of crops (pre-em) or during its early growth stage (post-em). The longer gap between herbicide application and crop harvest will facilitate complete or near complete degradation of the herbicides in the soil as well as in the plant system. It is our responsibility to ensure that our farmers use technology which is effective, economical, safe and sustainable.

N.T. Yaduraju

A Brief Summary of the ISWS Executive Council Meeting

The meeting of ISWS Executive Council (EC) took place on 20th February, 2013 at the Directorate of Weed Science Research, Jabalpur to handover the charge of the Society to the newly elected Office Bearers and to discuss various issues for revamping the Society. The members of interim EC for 2011-12 (Drs. TV Muniyappa, President; Sushilkumar, Secretary; VP Singh, Treasurer; KNK Murthy and ML Kewat, Joint Secretaries) and newly elected EC for 2013-14 (Drs. NT Yaduraju, President; TVR Prasad, Vice-President; AR Sharma, Secretary; and Shobha Sondhia, Treasurer were present in the meeting. Dr. Megh Singh, Professor (Weed Science), University of Florida, USA also participated in the meeting for a brief period and shared his views.

Dr. T.V. Muniyappa briefed the members about the work done by the past EC and conduct of the elections as per the resolution passed by the GB Meeting held at KAU, Thrissur (Kerala) on 19th April, 2012. Dr. Sushilkumar, the outgoing Secretary appraised about the achievements made by the past EC. All the members in the meeting thanked Dr. Devraj Arya for conducting the ISWS election in very smooth and fair manner. The charge of ISWS was handed over to the new EC by the outgoing President, Dr. T.V. Muniyappa to the newly-elected President, Dr. N.T. Yaduraju. After taking over the reign of Society, Dr. N.T. Yaduraju thanked all the members for electing him as the President of the Society. He mentioned that the new EC has to move fast by seeking cooperation of all members and reinstate their confidence in the Society. The President desired to strengthen the role of Councilors and enlarge the scope of ISWS activities in all states of the country. Dr. A.R. Sharma mentioned that all members should work selflessly and begin a new era in the ISWS. He expressed the hope that by cumulative efforts and team work, the Society will regain its lost ground and the rating of the Indian Journal of Weed Science will be improved in the coming years.

Details of the proceedings is available on http://isws.org.in/

Meeting of ISWS EC Held

A meeting of ISWS EC members was held at Directorate of Weed Science Research, Jabalpur on 4th May 2013 to review the progress on the agenda discussed in the earlier EC meeting held during February 2013. The following members were present.

Dr. N.T. Yaduraju, President
Dr. A.R. Sharma, Secretary
Dr. Shobha Sondhia, Treasurer
Dr. V.P. Singh, Ex-Treasurer
Dr. M.L.Kewat, Ex-Joint Secretary & Councilor (MP)
Dr. Sushilkumar, Ex-Secretary & Chief Editor, IJWS

Following decisions were made

- Process of renewal of Society with the Registrar, Bangalore should be taken on priority after due auditing of the account of the Society.
- It was decided to get all the pending issues of IJWS to be published by the end of July, 2013.
- The ISWS account at Hisar would be closed and transferred to Jabalpur account in Bank of India. It was also decided to transfer all the proceedings/journals/books/etc from Hisar to Jabalpur so that these could be supplied on demand by publisher or members. The website www.isws.in should immediately be closed to avoid confusion.
- Preparations for holding the next Biennial Conference at Jabalpur should be started immediately.
- The venue for holding 25th Asian–Pacific Weed Science Society 2015 in India need to be finalized immediately. It was decide to explore the possibility of holding the event in Jabalpur so as to give DWSR world-wide publicity. In case of non-availability of suitable venue in Jabalpur, the event could be held at New Delhi.
- The need was felt to get the PAN/TAN number of ISWS in view of Requirement from the industry to support the Society financially for holding workshop/conference, events etc.

Workshop on 'Taking Forward Herbicide Tolerant GM Crops: Opportunities and Challenges' Organized

Recognizing the need for newer weed management strategies and global rates of adoption of Herbicide Tolerant (HT) crops, Indian Society of Weed Science (ISWS) in association with Biotech Consortium India Limited (BCIL), organized a day-long workshop on "Taking Forward Herbicide Tolerant GM Crops: Opportunities and Challenges" on May 2, 2013 at NASC Complex, New Delhi. The workshop was attended by 60 participants including members of the Society, scientists from agricultural research institutions and State Agricultural Universities (SAUs), representatives from concerned government departments and industries.

Dr. A. R. Sharma, Director, Directorate of Weed Science Research, Jabalpur spoke about the current weed management practices and challenges faced by the farmers. Dr. N. T. Yaduraju, President, ISWS suggested using new technologies like HT crops for weed management as labour has become scarce and high cost of labour required for weeding operations is making the whole agricultural operations uneconomical. He indicated that ISWS is committed to using scientific approaches

and technological advances in the area of weed science for the benefit of farmers in the country. Dr. S. R. Rao, Advisor, Department of Biotechnology (DBT) indicated that while regulatory processes to evaluate the suitability of HT crops in India are underway, there should be parallel efforts by all stakeholders including the weed scientists, academia, industry etc. on addressing the concerns expressed about such crops in a strategic manner. Dr. Swapan K. Datta, Deputy Director General (Crop Science), Indian Council of Agricultural Research (ICAR) appreciated the timely initiative taken by the ISWS and BCIL in organizing this workshop. He stressed the need for public private partnership in taking forward the use of HT crops, which have proved to be extremely useful as evident from large scale cultivation all over the world. Dr. C. Chinnusamy, Professor, Tamil Nadu Agricultural University gave a presentation on 'Agronomic Advantages & Management of Herbicide Tolerant Crops in Indian Agriculture'. Dr. Samunder Singh, Secretary, International Weed Science Society gave a presentation on 'Herbicide Resistance in Weeds'. Dr. R. K. Malik, Former President, ISWS gave a talk on "Constraints including labor in weed management". He indicated that scarcity of labor along with increase in wage rates are a result of several complementary factors such as farmer family labor being moving out of agriculture, local agricultural labor moving to industrial sector for better wages and rural employment schemes like MNREGA. Dr. K V Prabhu, Head, Division of Genetics, IARI gave a presentation on 'Genetic Diversity, Gene Flow and Super-weeds'. He informed that gene flow is a natural phenomenon which occurs regardless of whether the crop plant was developed through conventional plant breeding or

biotechnology. Regarding the consequences of the gene flow, he indicated that about 50,000 tests in the field have already been carried out around the world and no indication of real dangers or consequences has been predicted. Dr. Vibha Ahuja, General Manager, BCIL gave a presentation on 'Food, Feed and Environmental Safety of HT Crops'. She informed that food and feed safety and environmental safety are two distinct components of safety assessment of GM crops supported by elements of molecular characterization.

Recommendations

- In view of the severe constraints of labour for agricultural purposes in the country, the management of weeds requires harnessing the advances made in cutting edge disciplines such as farm mechanization, biotechnology with the minimal role of labour.
- Dependency on manual labor be lowered to reduce drudgery particularly on women, who are primarily the ones engaged in weeding operation. This will also allow women to use quality time on secondary agricultural operations leading to increase in revenue.
- Information documents including specific studies on economical and environmental effects of HT crops may be compiled and circulated.
- Specific studies addressing socio-economic benefits of HT crops may also

be conducted and used for creating awareness.

- The HT crops which are under evaluation in fields viz. corn and cotton should be made available to the farmers at the earliest possible following the approval by the regulatory agencies.
- The country should take advantage of the available herbicide tolerant technology from the industry and adapt them in crops of interest such as wheat, rice and rapeseed mustard by following a sound public-private partnership model.
- Discovery and development of new herbicide tolerant technologies should be promoted in public sectors led by ICAR.
- Reduce over-reliance on herbicides for weed control by adoption of integrated weed management model. HT crops should form part of a comprehensive integrated weed management strategy to be formulated by the technology developers in association with concerned ICAR research institutions and State agriculture universities to be prescribed to the farmers.
- Herbicides as a group of pesticides are low in toxicity and are applied during the initial stages of crop growth, thereby having least or no residues in soil, food or feed when used at recommended levels.
- The concerns regarding pollen flow, biodiversity etc. have been studied and addressed by regulatory agencies in several countries. Available scientific information should be used to analyze the impact of GM crops on environment and biodiversity instead of assuming hypothetical risks. The information about food and feed safety studies has been well documented by international agencies such as OECD based on numerous studies and peer reviewed scientific papers.

Annual Group Meeting of AICRPWC Held

The Annual Group Meeting of All India Coordinated Research Project on Weed Control (AICRPWC) was held from 26-27 April 2013 at Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya Palampur. The scientists working in AICRPWC Centres, other ICAR institutes and representatives from herbicide industries participated in the meeting. Dr. S.K. Sharma, Vice Chancellor, CSKHPKV, Palampur inaugurated the Annual Group Meeting. While addressing the participants, Dr. Sharma mentioned that nearly 560 crops are being grown in India for economic gains, of which, about half are exotic. He emphasized on making stringent quarantine laws in the country to check the spread of weeds. Dr. S.P. Sharma, Director of Research informed that problem of weeds is increasing as a result of high-input intensive agriculture being practiced to meet the

growing food demand. Weed management could be the best option to increase food production. Dr. P.K. Sharma, Dean, College of Agriculture emphasized on developing eco-friendly weeds management techniques and weed utilization. Dr. J. S. Chauhan, Director, DRMR, Bharatpur informed the magnitude of *Orobanche* infestation in mustard in states like Rajasthan, Haryana,

Gujarat and Madhya Pradesh. He emphasized to study the biology, ecology besides management of Orobanche. Dr. A. R. Sharma, Director, DWSR, Jabalpur presented the research highlights of AICRPWC 2012-13. He mentioned that weed management technology is the fastest adopted technology on farmers's fields. Dr. Sharma stressed on weed management for conservation agriculture systems for sustainable food production. Several publications *viz., Dhan, Gehun evam Makka ke pramukh kharpatwar evam unka niyantran, Kharpatwar Niyantran*, Sustainable weed management options, and Major weeds of Tamil Nadu were also released on the occasion. Dr. N. N. Angiras, former Head, Agronomy and PI, AICRP-WC at CSKHPKV, Palampur was felicitated for his valuable contribution in weed management. Dr. D. Badiyala Principal Investigator CSKHPKV Centre proposed the vote of thanks.

NEWS IN BRIEF

Dr. Samunder Singh in Perth, Australia

Dr. Samunder Singh, Senior Weed Scientist of Agronomy Department, CCS HAU Hisar was invited to present an oral paper on 'Detection of ACCase herbicide resistance in Phalaris minor and its management in India' in the Global Herbicide Resistance Challenge Conference held at Esplanade Hotel, Fremantle (Perth), West Australia from 17-22 Feb. 2013. The International Conference was attended by more than 300 scientists from 30 countries on the important aspect of weed control and avoidance/management of herbicide resistant weeds. Herbicide resistance in Phalaris minor, a major weed of wheat is taking serious proportions in Haryana (India) where ACCase inhibiting herbicides (fenoxaprop, clodinafop and pinoxaden) are failing to control this weed in farmer's fields even at double the application rates. Earlier, this weed evolved resistance to isoproturon (1992) when many farmers had to plough up wheat fields or harvest it as fodder. Dr. Singh's paper was path breaking as the department has developed a technology to detect resistance to these commonly used wheat herbicides (clodinafop and pinoxaden). The early detection method developed by Dr. Singh can differentiate

between resistant and susceptible population of Phalaris by using seed, seedlings and even leaves of Phalaris under lab conditions. Based on these tests an advisory can be sent to farmers that will help to lower the cost of weed control, increase wheat yield and improve farmer's economy. The paper was highly acclaimed by many international scientists as it also addressed the issue of soil seed bank of Phalaris and its management strategies depending upon the level of resistance to different herbicides.

Recognitions and Awards

Dr.(Mrs.) K. Sivagamy and Dr. C. Chinnusamy, TNAU, Coimbatore received the 'Best Paper Award' for their paper on "Evaluation of Weed Management Methods in Herbicide Resistant Transgenic Maize" presented in the First International Conference and Third National Conference on Biotechnology,Bioinformatics and Bioengineering at Tirupati, Andhra Pradesh during 28th -29th June 2013.

RESEARCH HIGHLIGHTS

Weeds cause complete failure of direct-seeded rice in Meghalaya

Study undertaken at ICAR Research Complex for NEH Region, Barapani, Meghalaya, India revealed that uncontrolled weeds in direct-seeded rice caused total crop failure (Photograph 1) and application of cyhalofop butyl 80 g/ha at 25 DAS followed by 2,4-D 0.75 kg/ha at 35 DAS resulted in significantly higher rice productivity (4005 kg/ha).

Weedy

Cyhalofop butyl @ 80 g/ha at 25 DAS followed by 2,4-D @ 0.75 kg/ha at 35 DAS

Contributed by: D.J.Rajkhowa, U.S.Saikia & S.V.Ngachan
ICAR Research Complex for NEH Region
Umiam, Meghalaya, India

Conservation tillage reduces weed problems

Conservation agriculture based crop management practices *viz.,* permanent no-till residue managed beds and double no-till (zero till direct seeded rice- zero till wheat) reduced weed infestation in rice-based cropping systems of eastern Uttar Pradesh due to less weed seed bank disturbance in soil and proper cover of soil by the residue.

Double zero-till wheat

Greengram on permanent beds

Contributed by: U.P. Singh, Deptt. of Agronomy, Institue of Agricultural Sciences, BHU,Varanasi.

Weeds Watch

Alligator weed invaded lakes of Kashmir

Alligator weed (*Alternathera philoxeroides*), a perennial, floating emergent, noxious invasive aquatic weed, has recently invaded all famous fresh water bodies in Kashmir. Although subtropical weed supposed to be native of S. America has infiltrated Kashmiri lakes just some years before and has started causing serious threats, like many other noxious invasive. Alligator weed was reported for the first time in Wular Lake in the year 2008 in dispersed form, but now has spread to all fresh water lakes in thick mats, within such a short period of time, particularly in Dal Lake and in all its tributaries and channels. Now the weed in deep waters has started forming thick mats, large and extensive rafts are floating on the surface of water everywhere in Dal Lake and Nageen, with emergent body. Near shallow waters or lake margins it remains attached to the lake substratum. This weed has worldwide distribution. In India it was reported from Assam, Bihar, West Bengal, Tripura, Manipur, Andhra Pradesh, Karnataka, Maharashtra, Delhi and Punjab. It grows even in marshy boggy places and tolerates all abnormal weather conditions.

Another aquatic weed of concern in the lakes of Kashmir is Azolla, a water fern which was reported in the year 2004 for the first time. It already deteriorated the essence, charm, water quality and upgraded eutrophication, besides completely wiping out many of our medicinal and highly nutritional aquatic plants and also lots many underwater life forms from Kashmiri lakes: Manasbal Lake and Wular lakes, Nageen, Dal, Hokher Sar, Anchar.

Presently adopted methods such as surface removal are resulting in the noxious weeds to spread more rapidly. The state and national government authorities have a serious role to play in curtailing the invasion of the notorious aquatic weeds in Kashmir and other states of India.

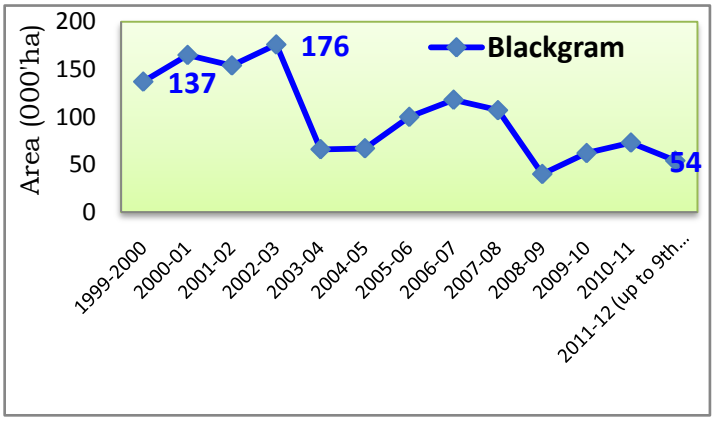
(Source link: http://www.greaterkashmir.com/news/2013/Jul/9/another-deadly-invasion-9.asp)

(Contributed by: A.N. Rao, India. anraojaya@hotmail.com)

Field dodder (*Cuscuta campestris*) reduces area of blackgram in rice-fallows of coastal Andhra Pradesh

Rice-fallows blackgram is the major traditional cropping system in coastal Andhra Pradesh, where farmers plant blackgram as utera cropping (broadcasting of blackgram seeds in standing crop of rice before harvest). However, in the recent times, the area under blackgram has

declined drastically due to severe infestation of weeds in general and parasitic weed Cuscuta campestris in particular. A recent study conducted in Guntur district of Coastal Andhra Pradesh revealed that the area under blackgram has declined from 176 thousand hectares during 2002-03 to 54 thousand hectares in 2011-12 and the farmers of the region have shifted from blackgram to maize and sorghum cultivation.



Contributed by: J.S. Mishra, DSR, Hyderabad

Congratulations to our Retiree - Prof. R. P. Singh

Born on August 15, 1947, Dr. Ram Pratap Singh graduated from U.P. College, Varanasi in 1966 and completed his M.Sc.(Ag) in 1968 from BHU. He was awarded Ph.D degree in1972 from Indian Agricultural Research Institute, New Delhi. He started his career at Banaras Hindu University as Lecturer in 1972 and rose to the level of Professor in 1991. He has to his credit 40 years of teaching, research and extension experience and has supervised 17 Ph.D. and 30 M.Sc.(Ag) students with 77 publications in journals of national and international repute.

Dr. Singh's contribution in the field of weed science and crop husbandry is widely appreciated. In recognition of his contribution, he was awarded Gold Medal of Indian Society of Weed Science (ISWS) and selected as Fellow of both Indian Society of Agronomy and ISWS. He was elected as President of Indian Society of Weed Science in (2002-2005) and acted as Chief Editor of Indian Journal of Weed Science (2007-2008). Dr. Singh was Head of Department of Agronomy from (2003-2006), Dean, Faculty of Agriculture (2007-2010) and Director (March 2011-August 2012), Institute of Agricultural Sciences, BHU. After his superannuation, Dr. Singh was appointed as Officer on Special Duty at RGSC Barkachha, Mirzapur where he undertook various

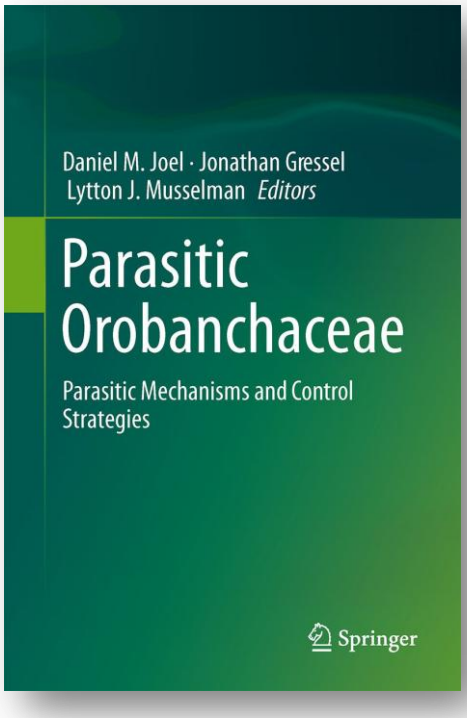
developmental activities including proposal for creation of Faculty of Veterinary and Animal Sciences. He has been instrumental in creating Malviya Free Coaching Centre for marginalized tribal people of Sonbhadra and Mirzapur districts.

The Indian Society of Weed Science wishes him a very happy, healthy and prosperous retired life. His permanent address is: N-1/12-2K, NAGWA, LANKA, VARANASI-221005, Uttar Pradesh, India; Phone 09450404137.

-Thank you to Dr. M.K. Singh, BHU, Varanasi, for submitting this news item

NEW PUBLICATION

D.M. Joel, Newe-Ya'ar Research Center, ARO, Israel; J. Gressel, Weizmann Institute of Science, Rehovot, Israel; L.J. Musselman, Old Dominion University, Norfolk, USA (Eds.)



Parasitic Orobanchaceae

Parasitic Mechanisms and Control Strategies

This book was written in response to significant recent advances in understanding the mechanisms of parasitism in the Orobanchaceae, and breakthroughs in the control of the parasitic weeds Striga and Orobanche. It consists of 26 contributions by internationally recognized leading scientists. The main book chapters are grouped into two parts: Part I – The Orobanchaceae and Their Parasitic Mechanisms; Part II – The Weedy Orobanchaceae and Their Control.

The first part provides cutting-edge information on all key aspects of plant parasitism, such as the structure, development and function of the haustorium; nutrient transfer and the physiology of the parasite-host association; host reaction to parasitic plants; seed production and germination; the strigolactones and host-parasite signaling mechanisms; the parasite genome, phylogenetics, evolution and epigenetics; and ecology. Topics of the second part include: the problem posed by the weedy parasites; population diversity and dynamics; molecular diagnosis of seed banks; and detailed discussion of the various management strategies, including agronomic, chemical and biotechnological approaches, as well as host breeding for resistance, allelopathy and biological control.

Ph.D. / M.Sc. (Ag.) THESES IN WEED SCIENCE

Mr. Babu Lal Meena: "Studies on efficiency of herbicides under different rice residue management practices in wheat". Ph.D. Thesis. 2013. BHU, Varanasi.

Advisor: Dr. R.K. Singh.

Mr. Rajeev Ranjan: "Effect of crop establishment method and weed management on growth and yield of Irrigated dry direct seeded rice". M.Sc. (Ag.) Thesis. 2013. BHU, Varanasi.

Advisor- Dr. M.K. Singh

EVENTS

Observing Parthenium Awareness Week

To create awareness among public about ill-effects of Parthenium and ways of its management, 'Parthenium Awarenesss Week' will be observed from 16 to 22 August, 2013 throughout India under the aegis of Directorate of Weed Science Research, Jabalpur involving all the centers of All India Coordinated Research project on Weed Control (AICRP-WC), Agricultural Universities (SAUs), Krishi Vigyan Kendra (KVKs), ICAR institutes and many municipalities.

The 24th Asian Pacific Weed Science Society (APWSS) Conference

22-25 October 2013

Venue: Padjadjaran University Convention Hall, Bandung, Indonesia.

Training Workshop on Principles and Practices of Direct-Seeded Rice

September 2013 CCSHAU, Regional Research Station, Karnal, Haryana

Contact: Dr. Ashok Yadav, Professor (Agronomy) & ACIAR Project Leader, Haryana
(aky444@gmail.com, Mob: 09416995523)

26th German Conference on Weed Biology and Weed Control

11 – 14 March 2014

Venue: Braunschweig, Germany

Go to http://www.unkrauttagung.de/ for more details.

4th International Symposium on Weeds and Invasive Plants

18 – 23 May 2014

Venue: Montpellier, France

Go to http://invasive.weeds.montpellier.ewrs.org/default.asp for more details.

You can view or download the first circular using the link below:
1st_Announcement_Invasive_Plant_Montpellier_2014.pdf (237 kb)

13th IUPAC International Congress of Pesticide Chemistry

Venue: San Francisco, US

Go to http://www.iupac2014.org for more details.

18th International Plant Protection Congress, "Mission Possible: Food for All through Adequate Plant Protection"

24 – 27 August 2015,

Venue: Berlin, Germany

Go to http://www.ippc2015.de for more details.

Mechanisms and Control Strate

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