



President's message

Dear Friends,

I am happy to address myself to you once again to deliver our IWSS Newsletter. A very demanding field season and travel commitments have delayed the appearance of this issue, for which we sincerely apologize. Nevertheless, we have lots of information in this issue and some great news, which I will briefly summarize here. Firstly, we are extremely happy to announce the recent establishment of the



Argentinean Weed Science Society (Asociación Argentina de Ciencia de las Malezas, ASACIM). This society is already working towards its first congress, which will be held jointly with that of the Latin American Weed Science Society (Asociación Latino Americana de Malezas, ALAM) in 2015. ASACIM gathers fine and renowned weed scientists and will be a most relevant focal point for weed science in Latin America's Southern Cone. We enthusiastically express our best wishes for the success of ASACIM.

Weed scientists all over the world continue to be very active and engaged in addressing the many challenges of weeds in managed and non-managed ecosystems, and a plethora of scientific events have taken place. In this issue you will find reports on meetings organized by the Asian-Pacific Weed Science Society (APWSS) in Bandung, Indonesia; the European Weed Research Society (EWRS) in Montpellier, France and in Uppsala (Sweden), jointly with the Nordic Association for Agricultural Scientists; the Indian Society of Weed Science (ISWS) and Haryana Agricultural University in Hisar, India; the Weed Science Society of the Jiangsu Province in Nanjing, China; and by Drs. Stephen Duke (USDFA-ARS) and Stephen Powles (AHRI, University of Western Australia) on Herbicide Resistance held during the 13th IUPAC Congress and 248th Meeting of the American Chemical Society in San Francisco, USA.

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We are proud of the IWSS members who have been honored with awards of excellence by several weed science societies around the world. Thus Prof. Li Yanghan was honored at the occasion of his 100th birthday by the Weed Science Society of the Jiangsu Province (Nanjing, China); Prof. R.K. Malik of Haryana Agricultural University (retired) was honored with a Lifetime Achievement Award from the Indian Weed Science Society; Dr. Vinod Shivrain of Syngenta received an Outstanding Weed Scientist Award from the Southern Weed Science Society (USA); Emeritus Professor Muhammad Soerjani (BIOTROP) was honored with the APWSS Fellow Award for his life time achievements. The Weed Science Society of America (WSSA) held its 2014 Annual Meeting in Vancouver, British Columbia, Canada. During this event, WSSA extended a Fellow Award to Drs. James Anderson (USDA-ARS, USA), Peter Sikkema (University of Guelph, Canada) and Dr. Tom Mueller (University of Tennessee, USA); an Outstanding Research Award to Dr. Neil Harker (University of Alberta, Canada); an Outstanding Reviewer Award to Drs. Dale Shaner of USDA-ARS (retired) and Prashant Jha (Montana State University, USA); and a WSSA Honorary Member Award to Dr. Per Kudsk (Aarhus University, Denmark), former Chair of the IWSS Scientific Committee for the 2012 International Weed Science Congress (IWSC) in Hangzhou, China.

We were saddened by the passing of two long time IWSS collaborators: IWSS Fellow Dr. Ralph Kirkwood from the University of Strathclyde, Glasgow, and Dr. Maria Olofsdotter who was a productive weed Scientist in Denmark and at IRRI in the Philippines. They will be greatly missed and we express our deep regrets to the families of Ralph and Maria.

The Executive Committee of IWSS had its open meeting during the WSSA Annual Meeting in Vancouver. The discussions mainly focused on the upcoming 2016 IWSC in Prague, Czech Republic, and on the IWSS President's report of his December 2014 trip to Prague. In Prague, I met with Professor Dr. Josef Soukup, Head of the Agroecology and Biometeorology Department at the Czech University of Life Sciences and Chair of the Local Organizing Committee for IWSC 2016. We are happy to tell you that the organization of the congress is in full swing. Dr. Soukup has gathered an excellent team of collaborators from his institution and has liaised with a local firm with ample expertise in the organization of congresses and conferences to undertake the operational tasks involved in the implementation of our congress. The venue of the event will be the Clarion Congress Hotel (<http://www.clarioncongresshotelprague.com/en/photo-gallery/>). Both the organizational expertise and the hotel facilities are excellent. In consultation with the supporting EWRS, Dr. Soukup has proposed candidates to integrate the Scientific Program Committee for IWSC 2016 that will be under the coordination of IWSS representative Dr. Bernal Valverde. Excursions during the congress, social programs and professional activities are also being planned. We look forward to continue reporting on the progress towards IWSC 2016 (<http://www.iwss.info/iwsc.php>). I would like to take this opportunity to welcome all those who have become new IWSS members and to thank those who have renewed membership with IWSS. I would also thank IWSS Secretary Dr. Samunder Singh for preparing this Newsletter. Thank you all for your kind support and best wishes.

Albert Fischer
President



ARGENTINA



ARGENTINA, Establishment of the Argentinean Weed Science Association (ASACIM)

Dear colleagues we are very pleased to inform you that on October 28, 2013, after a long way, we signed for the establishment of the Argentinean Weed Science Society (Asociación Argentina de Ciencia de las Malezas, ASACIM).

This journey began at the end of 2012 when in a meeting held in Tucumán (Argentina); a representative group of weed researchers and practitioners' presented their research projects and programs. On that occasion we discussed Argentina's severe weed problems and agreed on the need of a space to interact regularly to face them and we decided that it was important to establish an organization.

As a result, on October 28, 2012, we signed the act of commitment that was the kickoff for the establishment of ASACIM (Argentinean Weed Science Association). ASACIM is a civilian non-profit entity devoted to:

- i) encourage and promote the generation, development, collection and dissemination of knowledge related to weed science,
- ii) promote communication and interaction between individuals and organizations interested in weeds,
- iii) organize and support the implementation of scientific meetings and courses on weed topics of national and international interest,
- iv) cooperate with other national and international organizations with similar interests, in order to coordinate and promote scientific - cultural exchange,
- v) encourage, promote and disseminate a correct and uniform technical and scientific terminology about weeds,
- vi) contribute to the education and training of new specialists promoting actions, grants, awards, etc. and,
- vii) generate opinion on policies concerning weeds, their management, control and impact on society and the environment.

Some of the benefits offered by the Society to its members are:

Subscription to the periodical newsletter, continuing education courses and specialized workshops, reduced registration fee to the biannual Congress, interaction between the associates, interaction with other associations of weeds in the region and the world.

We have recently (August 6-8, 2014) co-organized with AAPRESID "Asociación Argentina de Productores de Siembra Directa" (Argentinean No Tillage Producers Association) a Workshop on Weeds in the context of the XXII Congress of AAPRESID in Rosario, Argentina.

Next year, we will organize the 1st Argentinean Weed Congress together with the XXII Latin-American Weed Association Congress (ALAM) in Buenos Aires, Argentina.

We are also working on the construction of a web page, whose link will be available soon.

Contact our association at asacim.malezas@gmail.com

-Elba de la Fuente, President

Members of the EC of ASACIM (L-R) : Martín Marzetti (Auditor), Elba de la Fuente (President), Pablo Kalnay (Vice-President), Claudio Ghersa (Treasurer), and María Luz Zapiola (Secretary)



CANADA

54th Annual meeting of Weed Science Society of America and 67th meeting of Canadian Weed Science Society, Hyatt Regency, Vancouver, British Columbia, Canada, Feb. 3-6, 2014

IWSS officers Dr. Albert Fischer, President; Dr. Nilda Burgos, Vice-President, Dr. Franck Dayan, Treasurer and Dr. Samunder Singh, Secretary attended the WSSA meeting and made scientific presentations. An Executive Committee (EC) meeting of IWSS was also held on February 2, 2014 in the Cypress Room of Hyatt Regency, Vancouver to discuss the current issues of the Society and forthcoming **International Weed Science Congress (IWSC) of 2016 in Prague, Czech Republic**. Dr. Bernal Valverde, Chair of the 2016 IWSC Scientific Program could not attend the EC meeting, but participated via teleconference and Dr. Baruch Rubin, Past-President IWSS conveyed his contributions through e-mail/telephone conversations. Dr. Singh discussed the web-based mailing system to communicate with all the registered IWSS members online. Modifications will be made in the system to sort out life and annual members, so that periodic reminders for membership renewal can be sent as well as other important messages. The account of all annual members will be reactivated in March upon verification by the Treasurer/Secretary of their active membership status. The Treasurer will circulate the revised list of members after WSSA meetings (most renewals are done through WSSA meeting registration) and later on quarterly basis.

Dr. Dayan presented the annual report of the treasurer. As of 31st January 2014, the Society had 393 members (172 life, 195 annual, 9 affiliate and 17 charter members). The regional distribution of members was: North America (194), Asia (75), Europe (43), Austrasia (25), Africa (21), and Central America (15). The financial position of the Society stands as \$73,600 in the bank, \$ 33,864 checking, \$38,491 in 8 months certificate, \$1245 in the money market. Merchant fee cost of \$582.56 was paid

at a rate of \$40/month plus transactions (approximately 10% of total money received). Major expenses were either for transaction fees or web page maintenance.



The EC also discussed Constitutional Amendments regarding Associate and Affiliate members. Article IV of the Constitution stipulates five types of membership and it was decided to merge Associate and Affiliate members. The President was of the view that for sustaining members; IWSS should adopt the WSSA system of having Platinum, Gold and Silver members. Sustaining members can be nominated by the Advisory Board.

Article VI deals with the constitution of Society Officers. Earlier, the position of Secretary-Treasurer was held by one person, but it was apparent that to improve efficiency, this should be split between two officers. Thus, the General Assembly of the Society approved such proposition during the IWSC of 2012 at Hangzhou, China. The next version of the Constitution will reflect this change.

Since the position of Chairman of Finance Committee (FC) is only active during the International Weed Science Congress, it was decided to delete the FC Chair position and the function of this committee to be led by the Past-President.

Article VII defines the Executive Committee. The Board members comprise the President, Vice-President, Secretary, Treasurer, Past-President, and a representative of regional weed science Societies. Amendment is needed as some of the Societies are defunct now. It was discussed to have Industry (Sustaining) members, Active Regional Societies representatives (Affiliate members), and Representatives of UN/FAO/World Bank or Sustaining members for the Advisory Board.

Amendments would also be needed in the By-Laws of the Society to further define the duties of the Vice-President. The existing By-Laws does not specify this matter.

In the meeting, the President stressed on enrolling more members particularly from poorly represented areas (Middle-east, Africa and Central America) by organizing special seminars/satellite meetings and sponsoring students. Dr. Bernal Valverde emphasized on supporting young weed scientists and Topic Organizers during the IWSC meetings. Given the success of the “Café” program in 2012 congress, it was decided to hold similar special sessions in the 2016 Congress that can be sponsored by Chemical manufacturers and/or Societies in Prague.

Open House Meeting of the Executive Committee

An open house meeting was held during the Annual WSSA meeting in 'Plaza A' of Hyatt Regency, Vancouver on 3rd February 2014 with the attendance of several members of IWSS and of WSSA. Dr. Albert Fischer, IWSS President, briefed the audience about the development of the Society's web page, its membership status, and publication of the Newsletter. He requested the participants to contribute more news items for publishing two issues of the Newsletter per year. The President also shared information about the facilities for the 2016 IWSC in Prague from his visit of December 2013 and meeting with Prof. Josef Soukup (Local organizer). Dr. Soukup is Head of the Department of Agroecology and Biometeorology at the Czech University of Life Sciences in Prague, and also the Scientific Secretary of the European Weed Research Society (EWRS). He will preside the Local Organizing Committee of the 2016 IWSC. Dr. Soukup offered Albert a tour of the 2016 IWSC facilities. Drs. Soukup and Fischer also visited with the local enterprise that will handle the operational aspects of implementing the Congress. Albert found the quality of the facilities at the Clarion Congress Hotel really impressive as well as the venue of the Congress. In terms of transportation, Prague has an excellent, friendly, and well laid-out, airport which is accessed by airlines from 52 counties covering 127 destinations. There is easy access to the hotel with standard transportation tariffs from the airport. Local transport in Prague was also highly convenient with excellent connectivity through trains, metro and city buses. An interesting and very convenient feature was the location of a subway station right below the hotel making extremely easy the connectivity between the venue, downtown, and the rest of the city. Local currency is the Czech Koruna (Kč, CZK), which can be exchanged at the airport upon arrival. Dr. Soukup has strong support from the University, the Mayor of Prague and the Czech Transport Authority, who are all cooperating towards the success of the 2016 Congress. Local organizers have excellent rapport with university authorities and the faculty of Dr. Soukup's department. Field tours with scientific contents are contemplated. Dr Fischer was also highly impressed by the quality and expertise of the local private congress organizers that will handle the operational aspects.



Dr. Bernal Valverde, Scientific Chair for 2016 Congress conveyed his vision for the congress through video link. He informed that there have been 26 main topics in the Durban Congress of 2004, 24 in Vancouver in 2008 and 22 in Hangzhou in 2012; therefore, main topics (MT) need to be reorganized and integrated. Bernal is liaising with scientists from different parts of the globe and MTs will be defined by January 2015. There will be plenary sessions on broad scientific topics followed by oral presentations and poster sessions. Plenary sessions should contemplate broad scientific topics, even outside weed science/agriculture. Topics of

interests and main speakers are being explored and will be discussed at the open board meeting of 2015 before finalization of a program. Some suggested topics were: Weed Science in 2025, RNAi technology, weed gene transcriptomics, nanotechnologies, effects of climate change on weed distribution and on herbicide efficacy, robotics in weed control, and alternative energies for weed control. There should be special sessions on useful topics such as: Entrepreneurship (establishing a start-up company based on an invention or unique service), or on dealing with intellectual property at the academic environment. Suggestions on topics by our members are most welcome and encouraged. It was agreed that strong emphasis should be given to poster presentations. There will

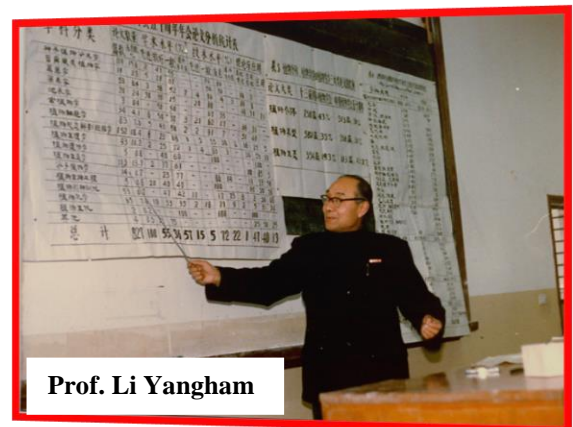
be a committee for Best Poster to award for each main topic and overall best papers from students or scientist's categories. There should be plenty of opportunities for discussion by having sessions similar to the café organized by Dr. Karl Hurlle in Hangzhou. Rather than having satellite meetings for working groups, the integration of disciplinary meetings/symposia into the program should be promoted. For example, there is already progress towards having the next International Bioherbicide Group Symposium as part of our program in Prague. The IWSC program should also establish sessions with topics attractive to industry that lend themselves to direct sponsorship. The program should be especially attractive to graduate students and young scientists by giving preferential opportunity to postdoctoral fellows, junior scientists and PhD students to integrate teams of Main Topic Organizers (MTO). We should enlist the help of the junior MTOs to produce well edited abstracts. Thus we will continue to use a funding scheme to sponsor graduate student paper presentation participation, and we should also make an effort to support senior weed scientists. WSSA, EWRS and IWSS joint sponsorship has helped more than two dozen students attend previous IWS Congress, and we hope the same will be repeated for the 2016 IWSC. Last but not least: We should strongly promote more women participation in the organization and as MTOs. We will further explore topics of interest and possible speakers for plenary sessions at the next open IWSS EC meeting in February 2015 during the WSSA annual meeting in Lexington, Kentucky.

-Samunder Singh, Secretary, ISWS

CHINA

International Symposium on “Weed Science and Sustainable Development in Agriculture” and the 14th Annual Conference of the Weed Science Society of Jiangsu Province, held in Nanjing, China, 6-8 April 2013.

This regional scientific meeting, organized by Nanjing Agricultural University, the Weed Science Society of China CSPP, the Weed Science Society of Jiangsu Province, and the Botanical Society of Jiangsu Province, gathered more than 200 participants, including many from other Chinese provinces and some international delegates, and commemorated the 100th birthday of Prof. Li Yanghan. Thirty seven oral presentations and more than 70 papers and abstracts were contributed to this symposium.



Prof. Li Yangham

Prof. Li is widely recognized in China as the father of weed science as a discipline and the founder of the China Weed Science Society. He was a botanist and dedicated his career to academia, working at Nanjing Agricultural University, where he trained and advised many graduate students in botany and weed science. He was a prolific writer and contributed important academic books such as the *Weed Flora of China*, *Morphology and Anatomy of Gramineae*, and *Vegetable Anatomy and Dissection Technology*. He also produced pioneer Chinese textbooks such as *Botany*,

Weed Science and popular science publications including *Botany: Elementary Introduction*, *Public Botany*, and *Wonderful Plant Adaptability*.

Prof. Li was a lifetime member of the International Weed Science Society and was recognized as honorary member of the Weed Science Society of America in 1987. He also served as Vice President of the China Society of Plant Protection, Vice President of the Botanical Society of Jiangsu, and Chairman of the China Weed Science Society.



For the occasion, the university modeled Prof. Li's statue and initiated the Li Yanghan's Scholarship based on donations. The journal *Weed Science of China* produced a special issue commemorating Prof. Li's 100th anniversary that included four memorial articles and 26 academic papers.

Dr. Bernal Valverde, IWSS Member at Large, conveyed the greetings from the IWSS at the opening ceremony by reading a letter sent by our President, Dr. Albert Fischer.

-Dr. Bernal Valverde



17th European Weed Research Society Symposium

Weed management in changing environments

Montpellier SupAgro, France, 23-26 June 2015

The European Weed Research Society (EWRS) and the French Association for Plant Protection (AFPP), together with the National Institute for Agronomy Research (INRA) and Montpellier SupAgro, are pleased to invite you to the 17th EWRS Symposium being held at Montpellier SupAgro, France. The four day symposium will address current issues and novel approaches in weed biology, weed ecology, spatial aspects of weeds, crop/weed interactions, weed management approaches, chemical weed management, and related disciplines along with a field trip. EWRS encourages junior scientists through subsidies to cover part of the expenses submitting an oral or poster paper.

- Prof. Henri DARMENCY,

INRA, UMR1347 Agroécologie, 17 rue Sully, Bat. Coste, BP 86510, 21065, Dijon, France. Tel: 33 (0)380

693186 ; Fax : 33 (0)380 693 262

e-mail: ewrs2015@dijon.inra.fr, <http://www.ewrs.org>



INDIA

National Seminar on Reorientation of Agricultural Research to Ensure National Food Security

A two-day National Seminar was organized at CCS Haryana Agricultural University, Hisar, India on national food security issues on January 6-7, 2014. This was of great relevance to the many scientists who attended the seminar. Dr. B. S. Dhillon, Vice-Chancellor of Punjab Agril University, Ludhiana was chief guest at the inaugural function presided by Dr. K. S. Khokhar, Vice-Chancellor of CCS HAU Hisar. The seminar organized by the Directorate of Research was attended by more than 500 eminent/young scientists, students, and industry officials. The seminar was sponsored by the Department of Science and Technology, Government of India.



Dr. Dhillon discussed the role of new technologies in converting the country from food deficient to food sufficient in the last six decades. However, there are great challenges to meet the food demand of 1.25 billion population under the threat of environmental changes and shrinking agricultural land and irrigation water. For sustainable development, we need to adopt new biotechnological tools along with efficient use of inputs by realigning the research priorities. An abrupt weather change in the last few years has imperiously dented the production potential of major crops. We have to be more innovative to produce enough to meet the demand of country's burgeoning population without any adverse effect on environment. Dr. Khokhar in his inaugural address deliberated about ensuring food security for the poor and malnourished children by a vertical increase in production without disturbing the fragile eco-system. There is a great challenge to increase private investment in agriculture by making it profitable for public-private partnership and supporting the small and marginal farmers. India is dominated by small and marginal farmers and it is a formidable task to retain farmers in the farming business. Though the challenge is universal, but more so in developing countries. Eight technical sessions deliberated on crop improvement for stress management and bio-fortification, resource conservation technologies for enhancing input use efficiency, soil health management for enhanced productivity, integrated farming system and diversified agriculture, eco-friendly plant protection approaches for safer food, post-harvest management and value addition, challenges and Socio-economic dimensions in food security and public-private partnership in food security.

Dr. Samunder Singh, Professor Weed Science, Agronomy Department, CCS HAU Hisar and Secretary, IWSS made a presentation on the Role of Resource Conservation Tillage (RCT) in enhancing input use efficiency and sustainability. Conservation Agriculture (CA) initiated 8 decades back in USA has been adopted in >127 m ha worldwide and contributed significantly to the increased production and improved soil health and lower environmental load. The role of RCT has been variable on weeds depending upon the situation. Increasing temperature and moisture stress have a negative impact on herbicide efficacy. Shifting from traditional puddled rice to direct seeded rice (DSR), saves water/labour and lowers the production of methane (significant contribution for global warming), but without efficient weed management DSR will not be adopted on a large scale. Adoption of Zero Tillage (ZT) in the Indo-Gangtic Plains (IGP) with rice-wheat cropping system greatly helped in the management of isoproturon resistant *Phalaris minor* in wheat in India in the last decade of 20th century. However, ZT alone was of no help to check the evolution of multiple herbicide resistance and an integrated approach is needed for successful management of *P. minor* in India. CA offers production stability with higher productivity and profitability with judicious use on inputs/capital cost and lower vulnerability to extreme weather changes which recently has become a cause of concern.

The other lead speakers of the seminar were: Drs. O. P. Yadav, Directorate of Maize, New Delhi (Genetic improvement for drought tolerance and biofortification – experience from pearl millet and maize); A. K. Joshi, CIMMYT (Wheat improvement for stress management and bio fortification); S. S. Gosal, PAU Ludhiana (Crop improvement for biotic and abiotic stress resistance); K. K. Singh, ADG (Engineering) ICAR, New Delhi (Integration of resource conservation technologies for paradigm shift in agriculture); N. K. Bansal, Farm Machinery and Power Engineering, CCS HAU Hisar (Role of machinery or crop residue management); N. Ravisankar, Project Directorate for Farming System Research, Modipuram (Integrated farming system research: current trends and the way forward); J. C. Dagar, Emeritus Scientist and Former ADG, ICAR; CSSRI Karnal (Agroforestry for rehabilitation of degraded lands, livelihood security and mitigation of climate change); Ramesh Arora, Department of Entomology, PAU Ludhiana (Biointensive IPM for ecofriendly management of insect pests); Indu Sharma, Directorate of Wheat Research, Karnal (Eco-friendly management of wheat diseases for enhanced sustainable production); R. K. Gupta, AICRP on Post-harvest technology, CIPHET, Ludhiana (Changing dimensions in post-harvest sector of horticultural commodities: Role of technology intervention); Baljeet S. Yadav, Department of Food Technology, Maharishi Dayanand University, Rohtak (Value addition in food agribusiness chain through food processing); Jitender Prasad, Department of Sociology, M. D. U., Rohtak (Some reflections on socio-economic aspects of food security: debating development issues); K. N. Rai, Consultant, Haryana Kissan Ayog, Panchkula (Economic dynamics of food security and sustainable development of agriculture); K. S. Kadian, National Dairy Research Institute, Karnal (Technology dissemination through technology business incubator (TBI) and business planning and development units (BPDu) for food security); R. K. Dhaliwal, Department of Extension Education, PAU Ludhiana (Agricultural growth in Punjab vis-à-vis national food security) and S. D. Chamola, Professor (Retd.) CCSHAU Hisar (Budgetary constraints in the implementation of food security act: public-private partnership (PPP) is the way out). All lead papers (Souvenir) and presentations are available online at <http://www.hau.ernet.in/research/rarfs2014.htm>. Contributory oral and poster papers presented for different themes are also available online in the compendium of abstract.

- Samunder Singh, Secretary, IWSS

Indian Society of Weed Science (ISWS) biennial conference on Emerging Challenges in Weed Management, Jabalpur, India, 15-17 Feb. 2014.

ISWS biennial conference at the Silver Jubilee Year of the Directorate of Weed Science Research (DWSR) at Jabalpur during 15-17 February, 2014 was attended by approximately 250 delegates from all over India and overseas, including members of the Society, scientists from agricultural research institutions and State Agricultural Universities (SAUs), representatives from the concerned government departments and industries.

CCS Haryana Agricultural University, Hisar was declared the **Best Research Center** from All India Coordinated Research Projects for excellence in weed science research and extension. Also honored was Dr. R. K. Malik, Professor Weed Science (Retired), CCS HAU Hisar with a Lifetime Achievement Award. Dr. Malik was also the recipient of International Weed Science Society award in 1996.



The Indian Society of Weed Science will organize the 25th Asian Pacific Weed Science Society Conference on Weed Science for Sustainable Agriculture, Environment and Biodiversity from 13-16 October, 2015 at ANGRAU Hyderabad, India, Contact: Dr. N. T. Yaduraju, President APWSS, Tel. +91 7893982456, email. nyaduraju@gmail.com.

- Samunder Singh, Secretary, IWSS

***Orobanche* in tomato making a big hole in the pockets of Haryana farmers**



Orobanche aegyptiaca, a parasitic weed created a huge distress in mustard (*Brassica juncea*) growing farmers fields of NW Haryana, adjoining the Rajasthan and Punjab states in India, drastically reducing mustard yield.

A lot of damage has already been done in the form of usurping nutrients, moisture and stunted crop growth by the time the plant emerges late in the season for flowering and seed formation. No selective pre- or post-emergence (PRE/POE) herbicide is available to knockdown the parasitic weed. However, repeat application of reduced rates of

glyphosate POE (2-3 times) provided some relief to the affected farmers. Since mustard is largely rainfed crop, soil moisture at glyphosate application time is crucial for increased herbicide efficacy. Though reduced rates of glyphosate (25-50 g ae/ha) has no effect on weeds; in the long run there could be vulnerabilities of resistance evolution in weeds.

Due to greater yield loss in mustard from *Orobanche aegyptiaca* parasitism, some farmers switched to raising a cash crop of tomato in the Aravali foothills of Haryana; however, after a few years, another species of *Orobanche* created havoc in the tomato fields in Bhiwani, Rewari, Mahendergarh and Nuh districts of Haryana State (India).

Field and pot studies using sulfosulfuron pre-plant incorporation/PRE/POE or application of metribuzin (PRE/POE), glyphosate (POE) and ethoxysulfuron (PRE/POE) failed to effectively control *Orobanche* parasitism in



tomato. Repeat applications of sulfosulfuron, glyphosate and ethoxysulfuron (PRE-POE or POE-POE) were not much effective, though ethoxysulfuron was found better among the herbicides

used. More evaluatory trials are needed to screen some effective herbicides against this parasitic weed in tomato. Each plant with > hundred pegs of *Orobanche* (photos on the left) is certain to cause havoc to tomato crop. The seed production potential is enormous as an average plant of *Orobanche* was found to have 50-120 flowers and each fruit capsule with 1500-2000 seed on an average. Miniscule



seed size helps easy spread with wind/water to inundate more fields in the vicinity. Also with the reported seed longevity of almost two decades; a short term crop rotation will be of little consequences in its management. Selective herbicides with short persistence (fruit residues) are required for its effective control, other than resorting to the use of genetically modified crop, which is still a taboo in many countries.

A tank mixture of pendimethalin and metribuzin applied at 1.5 kg/ha PRE for the control of *Orobanche* was found to trigger collar rot in tomato at one location in sandy soil causing significant reduction in plant stand. However, no such disease symptoms were observed under heavy soils at other locations. Though direct and indirect effect on pathogens for several herbicides has been reported including pendimethalin. Neither pendimethalin or metribuzin were found effective against *Orobanche* in these fields.



--Samunder Singh, Professor, Weed Science, CCS HAU Hisar, India

Congress grass (*Parthenium*) A scourge to Ecosystem

A seminar on *Parthenium hysterophorus* (Congress grass) awareness and management was organized by Central Soil Salinity Research Institute (CSSRI) Karnal, of Indian Council of Agricultural Research (ICAR) New Delhi on September 6, 2014. The seminar organized by Dr. **Parvender Sheoran**, Agronomist at CSSRI Karnal was sponsored by Monsanto Indian Limited, and attended by more than 200 persons representing ICAR, Regional Research Station of CCS HAU at Karnal, officials of



Dr. Indu Sharma, Director discussing the possibility of future use of Parthenium



Dr. Samunder Singh delivering a keynote lecture on Parthenium biology and management

Agriculture Department, Health Department, Municipal Corporation, Haryana Housing Urban Development Authority, School Teachers, Students and progressive farmers. Dr. Indu Sharma, Director, Wheat Research (ICAR), Karnal was the chief guest and Dr. Samunder Singh, Prof. Weed Science, CCS HAU Hisar was the keynote speaker. Dr. R. S. Chhokar, Directorate of Wheat Research, Karnal and S. Chaturvedi from Monsanto India Ltd. also made

presentations on herbicide application technology and history and use of glyphosate, respectively. Dr. D. K. Sharma, Director CSSRI Karnal welcomed the participants and discussed about the role of CSSRI and ICAR in sensitizing the public about the harmful effects of *Parthenium*. Dr. Sheoran informed the audience about the seriousness of *Parthenium* infestation including our vicinity and need of community approaches for its management.

Dr. Samunder Singh, through his presentation emphasised on the adverse effect on *Parthenium* not only on natural vegetation (uncropped land with 40% reduction in pasture production), but also on human/animal health (skin irritation, dermatitis, bronchitis, sore eyes, blisters, fever, asthma, eczema, and allergies, etc.) and now this is making inroads in cropped area as well costing the country US \$ 1 bn per year through its spread to the whole length and breadth of India. Defoliation of *Parthenium* by Mexican beetle (*Zygogramma bicolorata*) is effective to some extent in reducing its seed production, but there is no complete plant mortality and survival rate of beetles depends on temperature. High summer temperature of NW India is not favourable for the multiplication of beetles. There are only three pockets in Indian where they are more successful. However, native competitive plants viz. *Cassia sericea*, *C. tora* and *Chelopodium* sp (summer) in loamy sand and *Helianthus annuus* (wild) in sandy soil and *Cannabis sativa* under all situations are found effective in suppressing *Parthenium* along roadsides, railway lines and fallow spaces. For uncultivated areas, there are other competitive weeds also (*Sacharum munjo*, *Amaranthus hybridus*, *Xanthium strumarium*, *Abutilon bidentatum*, *Suaeda fruticosa*, *Indigofera hirsuta*, *Ipomoea carnea*, *Achyranthes aspera*, *Sida cordifolia*, *Peristrophe*



paniculata, *saccharum spontaneum*, *Accacia arabica* and *Panicum* sp. etc. which can suppress *Parthenium*, but may themselves prove costly later on. Cultivation practices viz. ploughing with mould board plough (lower germination from deeper soil depths) and Agronomic practices to raise smothering crops with early canopy cover and optimum plant stand can suppress this dreaded weed in crops. Glyphosate is the most effective herbicide, but may cost higher as *Parthenium* emerge in four flushes in a year (all year except December-January)

and can not be used in all situations. An integration of available tools (cultural, chemical and biological) and community approach is must for its effective management as repeated application of glyphosate alone has led to resistance evolution in Colombia. Dr. Chaturvedi from Monsanto informed that 1200 bn litre glyphosate is used world wide, compared to only 10 million liters in India where only IPA formulation is available, but Monsanto is planning to introduce Weathermax and other formulations in Indian market in the near future.

Dr. Indu Sharma informed the audience that as of today there may not be any commercial use of *Parthenium*, but it possess several acids (phenolic acids such as caffeic acid, vanillic acid, anisic acid, p-anisic acid, chlorogenic acid, and parahydroxy benzoic acid and others); they could be exploited in the future for medicines; however as of today we need to resort to its management using chemical, cultural and biological methods and community awareness is must for its management as informed by Dr. Singh. Dr. Parvender Sheoran told the participants that *Parthenium* can also be used as a raw material for composting, but it should be harvested before seed setting and should be fully decomposed to avoid further spread of seed through organic fertilizer. He thanked all the participants/speakers and wish the community approach can lower the onslaught of *Parthenium* on native vegetation and adverse effect on human health.

- Dr. Samunder Singh, Professor Weed Science, CCS HAU Hisar, India

INDONESIA

The 24th Asian-Pacific Weed Science Society Conference, The Role of Weed Science in Supporting Food Security by 2020 was held at Bandung, Indonesia from October 22-25, 2013. About 200 delegates from 17 countries participated in the conference with lead/invited presentations, oral and poster papers.

The Society honored ***Emeritus Prof. Dr. Muhammad Soerjani*** with the *APWSS Fellow award* for his *lifetime achievements*. He *shaped the landscape of agriculture in general and weed science in particular in Indonesia, guided several students, actively involved in organizing APWSS meetings, advised government, and was instrumental in the establishment of several institutes in Indonesia.*

The keynote speakers were from the Ministry of Agriculture and Forestry, Republic Indonesia and Prof. Dr. Steve Adkins, University of Queensland (Australia). Dr. Adkins in his keynote presentation stressed the current problems and future approaches in effective weed management in the Asian-Pacific regions to meet the food demand and environmental security.



*Dr. Albert J. Fischer, invited speaker, President, International Weed Science Society, and Prof. Dept. of Plant Sciences, University of California, Davis, USA, discussed 'Management of Multiple-Herbicide Resistant Echinochloa spp. in Rice'. Echinochloa species are one of the most troublesome weed of rice throughout the rice growing fields in the world, their acquired multiple herbicides resistance has made it challenging for herbicide control. Albert suggested use of synergistic herbicide combinations, rotation of herbicides of different mechanisms, alteration of dry and flooding method, stale seedbed techniques with no till rice stand establishment to mitigate the evolution of resistant weeds. Allelochemicals are long sought after molecules to manage weeds. Dr. Yoshiharu Fujii, Department of Agriculture, Tokyo University of Agriculture and technology (TAT) International environment and agriculture sciences (IEAS), Tokyo Japan, deliberated on 'Isolation and identification of allelochemicals from traditional crops and utilization for agriculture'. Successful screening, isolation and identification revealed potential allelochemicals, such as L-DOPA, cyanamide, rutin, lycorine, salicylic acid, militarine, and cis-cinnamic acid from velvetbean (*Mucuna pruriens*), hairy vetch (*Vicia villosa*), buckwheat (*Fagopyrum esculentum*), higan-bana or red spider lily (*Lycoris radiata*), jvano-hige or dwarf mondo grass (*Ophiopogon japonicas*), shi-ran or hyacinth orchid (*Bletilla striata*) and, yuki-yanagi or Thunberg spiraea (*Spiraea thunbergii*), respectively. Dr. Hisashi Kato Noguchi, Department*

of Applied Biological Science, Faculty of Agriculture, Kagawa University, Kagawa, Japan also discussed rice allelochemicals, momilactone plays a crucial role in rice allelopathy'. Rice secretes momilactone A and B from their roots; the amount of which increases towards flowering. Momilactone B has been found to have allelopathic effect on barnyardgrass.

Prof. Dr. Kwang Ho Park, Department of Food Crops Korea National College of Agriculture, and Fisheries Hwaseong, Korea, made a presentation of weed control using robotics. Mechanical weed control is getting increased attention not only in organic farming, but also in situations where weeds have become a nuisance under continuous use of herbicides (weed flora shift and resistance). A prototype of battery operated robotic weeder with camera and sensors was developed and refined by the team headed by Dr. Park that can navigate in paddy fields, which not only cut and bury the weeds in soil, but also the mud-churning process restricts light penetration thus decreasing new weed establishment. The robotic weeder was found effective to control weeds at a rate of 0.8 ha/day in machine transplanted rice (equal row-row and plant-plant distance) when used at three intervals (15-20, 25-30 and 35-45 DAT).

Managing weed seed bank is very important to avoid crop-weed competition and herbicide resistance. Presentation of Trevor James and Anis Rahman, AgResearch, Ruakura Research Centre, Hamilton, New Zealand addressed manipulation of soil seed bank for their successful management. For long-term and successful weed management, knowledge is required on the weed species infesting in a field, seed size, periodicity of emergence (different flushes), cultural, chemical, and mechanical methods used, as well as on edaphic and environmental factors.



The three days intensive meeting (22, 23 & 25th October) and field trip on 24th October provided opportunity to discuss various topics on weed management and interaction with participants, enriched through a conference dinner and a cultural program on 22nd October at Padjadjaran University Convention Hall Bandung Indonesia.

25th Asian Pacific Weed Science Society Conference on Weed Science for Sustainable Agriculture, Environment, and Biodiversity will be held on 13-16 October, 2015 at ANGRAU Hyderabad, India.

- Samunder Singh, Secy., IWSS

NIGERIA



Nigeria releases first generation of herbicide-resistant hybrids

The Nigerian National Variety Release Committee (NVRC) has released the first generation of maize hybrids, resistant to metsulfuron, that are also endowed with resistance to the noxious parasitic weed *Striga hermonthica*.

The hybrids were developed by the International Institute of Tropical Agriculture (IITA) in partnership with DuPont Pioneer Seeds using conventional breeding with funding from IITA and the Integrated Striga Management in Africa (ISMA) project as part of strategies to control *S. hermonthica* in maize.

The hybrids were released as P48W01 and P48W02 and are recognized as IITA IR-Maize Hybrid 2 and IR-Maize Hybrid 4. The hybrids have a yield potential of up to 5 t/ha under *Striga* infestation in comparison with local varieties that produce less than 1.0 t/ha under such conditions. “These hybrids are the product of introducing a single nuclear gene that confers resistance to imidazolinone herbicides, including metsulfuron methyl (MSM), into inbred lines with known field resistance to *S. hermonthica*,” Dr. Abebe Menkir, IITA Maize Breeder, said.

Recent baseline studies conducted under the ISMA project showed that farmers ranked *Striga* as the number one constraint to maize production in northern Nigeria, with 50 to 100% of the households reporting *Striga* incidence in their farms. The parasitic weed infests more than 9 m ha planted to millet, maize, and sorghum in Nigeria and severely lowers the production capacity of these crops.

Dr Menkir said yield losses in maize from damage by *S. hermonthica* varied from 20 to 80% among subsistence farmers, but 100% loss could occur in susceptible cultivars under severe infestation in marginal production conditions. The released herbicide-resistant hybrids allow seeds to be planted that have been treated with low doses of metsulfuron. This targets *S. hermonthica* before or at the time of its attachment to the maize root, killing the parasite underground before it inflicts damage on the crop. These hybrids can thus be used to deplete the *Striga* seed bank in the soil and minimize yield losses in subsequent cereal crops. MSM-treated seeds of these hybrids can be integrated into the diverse farming systems in Nigeria because the herbicide effectively controls the parasite at a low rate of application.

The ISMA project works with the private sector to catalyze the process of producing and marketing treated seeds of herbicide-resistant maize hybrids to smallholder farmers in Nigeria to control *S. hermonthica*. Other collaborating partners engaged in extensive testing of these hybrids include the Institute for Agricultural Research (IAR) and Agricultural Development Programs in Bauchi and Kano States.

For more details, please contact: Abebe Menkir, a.menkir@cgiar.org or Godwin Atser, g.atser@cgiar.org

-Prof. J. Gressel, Israel

PHILIPPINES

Regional Workshop on Herbicide Mode of Action and Resistance

BASF-ARS, Bay Laguna, Philippines, May 22, 2014

BASF-Asia hosted and sponsored a Herbicide Mode of Action and Resistance workshop at their Agricultural Research Station in Bay, Laguna, Philippines on May 22, 2014. About 50 scientists from eight Asian countries including China, Germany, India, Indonesia, Japan, Malaysia, Singapore, Thailand,



Trainees and participants of Regional Workshop on Herbicide Mode of Action and Resistance
BASF-ARS, Bay Laguna, Philippines, May 22, 2014



and the Philippines participated in the training. While the majority of participants were country representatives of BASF, scientists from the International Rice Research Institute (IRRI-Philippines), PhilRice, the University of the Philippines at Los Banos, and the Visayas State University (Philippines) were also among the attendees. Lectures were provided by Dr. Liliana Parra (Biochemist, BASF-Germany) and Dr. Nilda Roma-Burgos (Weed Science Professor, University of Arkansas, Fayetteville, USA). Classroom discussion was followed by training on herbicide symptomology and spectrum of activity using multispecies field plots established for the event at the Station. Most, if not all, participants have not had the opportunity to learn the activity of a wide array of herbicides in this manner. At the culmination of the workshop, Dr. Burgos encouraged participation in the International Weed Science Society and encouraged personnel from academia to strengthen their Weed Science programs because of a great need for well-trained weed scientists. Dr. Aurora Baltazar, recipient of the Outstanding International Weed Scientist Award at the 2012 IWSC in Hangzhou, China also participated in the workshop.

-Nilda Burgos, President Elect, IWSS

SWEDEN

EWRS/NJF WORKSHOP ON RECENT ADVANCES IN IWM 'PERENNIAL AND ANNUAL WEEDS'

The workshop on Recent Advances in IWM was organized in collaboration with NJF (Nordic Association for Agricultural Scientists) working group "Perennial weeds" and the EWRS working group "Crop-Weed Interactions" at the Ecology Center at the SLU Campus in Uppsala, Sweden from 27-29 January 2014. The workshop was attended by 23 participants from 12 countries. Twenty presentations were made in five sessions followed by interesting discussions. On Monday and Tuesday, the conversations were continued during joint dinners organized at the Ecology Center and at Sunnersta Herrgård, the location was where most foreign participants stayed overnight. The local arrangements by the SLU staff and students was gratefully acknowledged.

The first session, on perennial weeds, focused on the factors influencing both growth and control of the most common perennial weed species in the Nordic-Baltic region. Integrated control measures were addressed in terms of crop-weed competition, mechanical control methods and timing of treatments. New interesting results related to the compensation point of perennial species (the time when the energy resources in underground regenerative structures are at minimum level).

The next session focused on cultural weed control. In winter wheat, crop density, time of sowing and cultivar were identified as important factors, whereas spatial distribution did not seem to be of consequence. The methodology for identifying crop traits, responsible for competitiveness against weeds and various aspects related to seedling vigour were discussed. Also the first results of a long-term experiment for studying the influence of crop rotation in maize based cropping systems were presented. This session continued on Tuesday on synergism among cultural weed control measures and the competitive ability of cereal cultivars. Future research should identify wherein the life cycle of weeds cultural control measures can reinforce one another to reduce the size of weed population most efficiently. The suppressive ability of cereal varieties can reduce the impact of weeds on crop yield and seed return to the soil seed bank.

The third session dealt with competition and growth on a range of crop-weed combinations. The more traditional arable cropping system was represented by large sized field trials on the competition between wild oat and spring wheat and the comparison of the competitive ability of different spring barley varieties. Perennial weeds in grasslands were represented by a study on the competitive effect and spread of soft rush and compact rush (*Juncus* spp.) in extensive pastures and more intensively managed leys along the western coastline of Norway. Focus was on the influence of soil moisture and organic matter on the competitive ratio between *Juncus* spp. and *Poa pratensis*. Two presentations discussed the role of crop-weed competition during the establishment phase of *Salix* genotypes (willow). In the first presentation, the commonly practiced winter-storage of willow cuttings was questioned. Establishment of willow stands derived from stored cuttings was compared to fresh cuttings under both weed-free and weedy conditions. In another presentation the weed-free period of willow plantings was discussed. In this study white mustard and spring barley were used as model weeds.

In the fourth session, different aspects of direct weed control measures were discussed. In Finland, practices for tillage have changed. Stubble cultivation and direct drilling have become more common, which influences on the composition of the weed flora. In Norway, the effects of different timing of soil cultivation on perennial weeds have been studied and interesting results were presented. A study on the combinations of mechanical and chemical weed control in oilseed rape performed in Sweden was presented and it was shown that such combinations can be implemented with advantage to further develop integrated weed management strategies.

The last session was on IWM, an issue that in fact had already been an important topic throughout the workshop. In an informative and interesting talk on ‘Challenges for IWM implementation in EU crops’, the consequences of the new EU policy were illustrated. This was followed by a fruitful discussion on the role of GM-crops and the opportunities and problems with implementing IWM in Europe. After this final session, the local organizers were thanked once more for facilitating the workshop and for their great role in turning this workshop into a great success.

-Lammert Bastiaans, EWRS Crop-Weed Interactions WG; [lammert,bastiaans@wur.nl](mailto:lammert.bastiaans@wur.nl)



USA

Symposium on Herbicide Mode of Action and Resistance Management

A symposium on Herbicide Mode of Action and Resistance Management was held on August 12, 2014 in San Francisco, USA, during the 13th IUPAC International Congress of Pesticide Chemistry and the 248th Meeting of the American Chemical Society. The symposium covered herbicide mode of action discovery and the need and importance of alternative technologies. The primary focus was on new approaches to herbicide discovery, herbicide alternative technologies, resistance probability and prediction, as well as the latest approaches to resistance mitigation and thus herbicide sustainability. The event was organized by **Drs. Stephen Duke**, USDA-ARS and **Stephen Powles**, University of Western Australia. Key topics addressed in oral presentations were: Mechanisms through to management of herbicide resistant weeds by **S. B. Powles** (AHRI, University of Western Australia, Australia); What have we learned from waterhemp (*Amaranthus tuberculatus*)? By **P. J. Tranel** (University of Illinois, USA); Genomic approach to reveal non-target site herbicide resistance mechanisms by **R. Beffa**, T. Gaines, L. Lorentz, A. Figge, F. Maiwald, M. Ott, H. Han, R. Busi, Q. Yu, and S. B. Powles (Bayer CropScience, Germany, and University of Western Australia, Australia); New insights into the molecular basis of metabolism-based herbicide resistance in weeds by **R. Edwards** (Newcastle University, UK); Update on *EPSPS* gene amplification in glyphosate-resistant weeds by **T. A. Gaines** (Colorado State University, USA); Herbicide resistance in Iowa: An estimate for herbicide resistances in *Amaranthus tuberculatus* by **M. D. Owen** (Iowa State University, USA); New herbicide modes of action: Target identification and beyond by **K. Kreuz** (BASF, Germany); BioDirect™ and managing herbicide resistant *Amaranth sp.* by **R. D. Sammons**, D. Wang, S. Reiser, S. Navarro, N. Rana, and G. Griffith (Monsanto, USA); Revisiting resistance to fungicides and insecticides: What is not the same and what have we in weed control learned from them? By **H. J. Strek** (Bayer CropScience, Germany); the closing presentation was by **H. J. Beckie** (Agriculture and Agri-Food Canada) on Managing herbicide-resistant weeds over the next 20 years. There was also an interesting poster session, and the prize to the best poster was given to: “Glyphosate resistance in *Amaranthus palmeri* involves multiple mechanisms by **D. Giacomini**, D. Wang, J. Silva, N. Tao, P. Westra and D. Sammons (Monsanto, Colorado State University, USA). Presentation and poster sessions were followed by animated discussions by a motivated audience. Abstracts are available from internet: http://www.iupac2014.org/wp-content/uploads/2014/07/IUPAC_CONGRESS_2014_Abstracts.pdf

- Albert Fischer, President, IWSS

Precision herbicide moves toward commercialization

By Lisa Deeney, March 11, 2014, <http://www.agriland.ie/>

Precision farming technology that will allow reduced herbicide use by accurately identifying and spot-spraying weeds, developed from research funded by the Horticultural Development Company (HDC), is to go into commercial production. The prototype device combines an innovative image analysis-based system for identifying a variety of weeds in row crops, coupled with a choice of two precision spraying modules to directly apply herbicide either to single spots or to small patches of weeds. The technology is based on evidence from HDC project FV 307a, entitled 'Reducing herbicide use in row crops with targeted application methods treating detected weeds in small patches or spots'. "We looked at how combining new spray technologies with vision guidance techniques can deliver targeted application of selective or total herbicides," explained lead researcher, Dr Paul Miller of Silsoe Spray Applications Unit.

"The results showed high precision for spot application to weeds in onions, leeks and sugar beet—an advance on an earlier technique pioneered to develop spot application of glyphosate to volunteer potatoes in onions and carrots." Speaking on behalf of Garford Farm Machinery, which is to commercialize the technology, Philip Garford said: "Results from field experiments have showed that this technology has great potential to benefit field vegetable growers. We are pleased to be working with the research team to develop the device into a commercially viable product." Leek grower Patrick Allpress of Allpress Farms added: "Growers are always under pressure to reduce chemical use, so we welcome the development of this device that could eliminate the need for broadcast herbicide application."

The HDC funds projects to support the commercial development and sustainability of horticultural crop sectors. HDC Knowledge Transfer Manager, Rosie Atwood, said: "Providing value for money for levy payers is at the heart of everything we do. We're excited that this research has led to the commercial development of a practical, useful tool that will not only cut costs for field vegetable growers while maintaining effective weed control, but will also reduce the impact of chemicals on the environment."

Outstanding Weed Scientist Award to Vinod Shivrain

Dr. Vinod Shivrain, Research Scientist (Syngenta) at Vero Beach, Florida was honored by Southern Weed Science Society for 2013 Young Weed Scientist Award during its annual meeting held at Birmingham, Alabama in January, 2014.



Vinod receiving award from Prof. Thomas Mueller

Vinod is a highly motivated weed scientist with several years of proven experience in independent and collaborative laboratory and field research and new product/trait development. After completing his B.Sc. (Hons) Agriculture from C.C.S. Haryana Agricultural University, Hisar, India; Vinod pursued his Master's program at University of Arkansas, Fayetteville under the guidance of Dr. Nilda Burgos. He worked on the molecular characterization of acetolactate synthase (ALS) gene and phenotypic diversity in red rice (*Oryza sativa* L.). He continued with his PhD degree at the University of Arkansas,

working on the molecular phylogeny, genetic diversity, and reproductive biology of red rice and its influence on outcrossing rate with herbicide-resistant rice cultivars.

Dr. Sivrain is a member of Weed Science Society of America, Northeastern Weed Science Society, Southern Weed Science Society, and International Weed Science Society. He has authored/co-authored 15 refereed journal and 17 non-refereed journal articles, and 66 abstracts and made several presentations in national and international conferences.

He was the recipient of Dale Bumpers Outstanding Masters Award (2004), Ronald and Alice Talbert Weed Science Scholar Award (2005), Spooner Scholar Award (2006), CSES Gerald O. Mott Meritorious Student candidate (2007) and Outstanding Ph.D. Student of the Department of Crop, Soil, and Env. Sciences, UARK (2009). Vinod received IWSS Graduate Student Travel Grants in 2004 and 2008 for presentations at the Congress and the National Science Foundation Travel Grant in 2005 for Plant Microarray Short Course. Vinod received 1st place awards for the SWSS graduate student poster contest in 2005 and oral presentation contest in 2008. He was also the recipient of Honorary Outstanding Article in Weed Technology in 2007. He loves mountaineering just as he enjoys participating in the SWSS Weed Contest where he won 1st place (individual) in 2004 and 2006 and was a member of the UA Weed Team that won first place in 2003, 2004, 2005, and 2006 (and most years)



For his persistent achievements he was also honored with Syngenta Award 2010 – Breaking Barriers, Innovation from open collaborative platforms. Many congratulations, Vinod and IWSS wishes all the best for your future endeavors.

WSSA Fellows

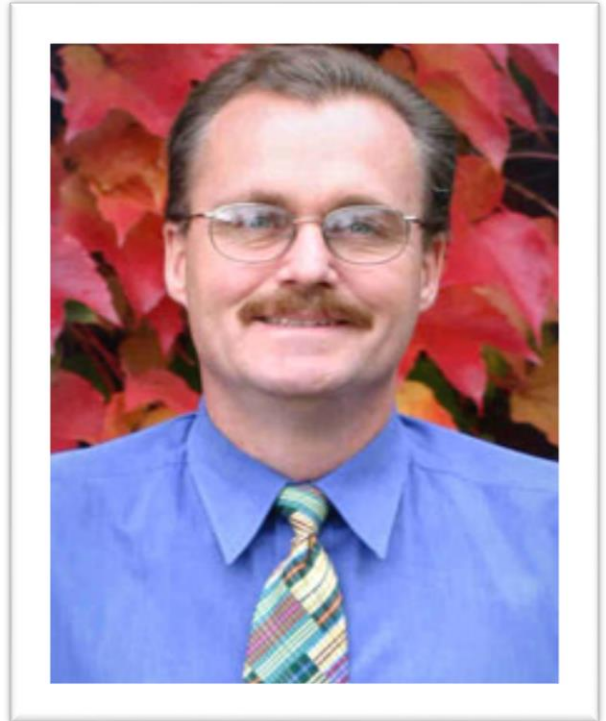
Weed science society of America honored the following weed scientists for their significant accomplishments during the WSSA/CWSS joint meeting at Vancouver, Canada on 04.02.2014. They are also members of International Weed Science Society and we are proud of their achievements.

James V. Anderson, Ph.D.,

Dr. Anderson is a researcher at USDA's Agricultural Research Service and best known for developing genomics programs for perennial weeds. He has several accomplishments to his credit. His research accomplishments have been documented in 90 published articles and



128 abstracts. At ARS, James created guidelines for scientists working with invasive plants and developed an Interagency Research Coordination Workshop to address pest invasions, fire-prone environments, and restoration. His long-standing involvement with WSSA includes serving on the executive committee.



Peter H. Sikkema, Ph. D

Peter Sikkema obtained his B.Sc., M.Sc., and Ph.D from the University of Guelph where he presently work as Professor. Dr. Sikkema focuses on the development of precision weed management programs in corn, soybean, edible bean, and cereals for improved weed control, reduced crop injury, higher crop yields and maximize net returns to Ontario producers.

Presently, he is working on IWM in edible beans, effect of day time on herbicide performance, sustainable weed management in glyphosate-resistant crops through residual herbicides and control of problematic weeds in corn, soybean, and wheat. Peter has published 182 peer reviewed manuscripts and authored or co-authored 86 oral presentations and 97 poster papers in scientific conferences. He has served on the boards of WSSA, the Canadian Weed Science Society, and the North Central Weed Science Society. He has served as president of the Canadian Weed Science Society and received numerous awards for his contributions to teaching and significant contribution in weed science research.

Thomas C. Mueller, Ph. D

Thomas is a professor of plant sciences at the University of Tennessee. Tom is most popular Weed Science teacher not only in Tennessee, but to the whole of South-West and USA. He grew up on a small grain farm in rural Illinois, where his family farm produced weed free corn, soybeans, and wheat. His interest in plants led to his B. S. in



1983 from University of Illinois, M. S. from University of Kentucky in 1987 and PhD from University of Georgia in 1990. Dr. Mueller joined the University of Tennessee in 1991 as an Assistant Professor, promoted to Associate Professor in 1996 and Professor in 2003. Tom specialized in the environmental fate of herbicides in soils and herbicide-resistant weeds. Dr. Mueller has published more than 100 refereed papers. He had been very active in professional societies and served as Newsletter Editor, Secretary-Treasurer and Executive Board member of Southern Weed Science Society, Publications board and Associate Editor for Weed Technology in the Weed Science Society of America, National Alliance of Independent Crop Consultants, the American Chemical Society (Agrochemicals division), CAST, and others.

Outstanding WSSA Research Award

K. Neil Harker, Ph.D.

Dr. Harker is an adjunct Professor, University of Alberta and is working at Agriculture and Agri-Food Canada at Lacombe, AB, Alberta. He has developed expertise in environmentally sustainable integrated weed management systems, weed biology, competition and weed-crop interactions, IWM in barley, canola, peas and wheat, interactions of weeds, insects and diseases in agronomic systems and herbicides. He is currently focused on the ecological and economic implications of GM crops, integrated management systems for canola, barley, beans and increased input efficiency, climate change and yield stagnation of winter wheat. Neil has published 166 refereed journal articles and 12 book chapters. He is actively associated with WSSA, CWSS, WWSW and was honored by WSSA as its Fellow.



Outstanding WSSA Reviewer Awards

Prashant Jha, Ph. D.

Prashant is an assistant professor of weed science at Montana State University's Southern Agricultural Research Center. Prashant did his B. Sc. (Hons.) Agri. (2001) and M. Sc.

Agronomy (2003) from CCS Haryana Agricultural University, Hisar, India and PhD (2008) under the guidance of Jason Norsworthy from Clemson, SC, USA. He was first to confirm glyphosate resistant *Kochia* from Montana and is working on its mechanism and management aspects. His research on IWM strategies for dryland and irrigated cropping systems emphasizes weed biology and ecophysiology, weed seed bank dynamics, molecular mechanisms of herbicide resistance in weeds, and development of alternative herbicide systems and integrated tools to combat herbicide resistance.



Dale Shaner, Ph. D.

Dale, a Weed Physiologist is an industry consultant after retiring from USDA's Agricultural Research Service (2001-2013) and from private industry. Dr Shaner did his Ph.D. in plant physiology in plant water relations from the University of Illinois and worked as an Assistant Professor at the University of California, Riverside from 1976-1979. Later he joined American Cyanamid in 1979 where he worked in herbicide discovery research for 22 years. It was at American Cyanamid that Dr Shaner helped discover and develop the imidazolinone herbicides and the imidazolinone resistant crops, where he then became involved in herbicide resistance in the mid-1980s with the selection of imidazolinone resistant weeds. He has been an active voice in herbicide resistance management for ALS inhibitors and glyphosate, helped to establish the Herbicide Resistance Action Committee, which he also chaired. Shaner is a Fellow, former board member and former president of WSSA. His research over the past decade has had a significant impact on both the scientific community and agricultural communities in the US; developing methods to detect glyphosate resistance in weeds with a leaf disc assay as well as conducting research on enhanced atrazine degradation in the soil. Dr Shaner served in the Scientific committee for the 2008 IWSC in Vancouver, Canada.



DENMARK

WSSA Honorary Member

Per Kudsk, Ph.D.

Dr. Kudsk is a Professor at Aarhus University in Denmark. He is head of Crop Health and deputy head of the Department of Agroecology and has leading involvement in Pesticide Research and Environmental Chemistry and in Integrated Pest Management. His research activities focus on weed control in arable crops, growth regulators and herbicide evaluation. He has worked on herbicides in the past, but now he has shifted to IWM using allelopathy and laser technologies for weed management and to herbicide effects on non-target plants. He represents Denmark on the European Plant Protection Council Working Party on Plant Protection Products and on the OECD Expert Group on integrated pest management. In 2012 he chaired the Scientific Program Committee of the 6th International Weed Science Congress in China. Per was also involved in EU Projects in the Baltic countries and Poland and in a Danida financed project on IPM in Eritrea. He is a former President of the European Weed Research Society and a member of the editorial boards of the journals *Weed Research*, *Pest Management Science* and *Journal of Plant Protection Research*. He also is member of the Danish Strategic Research Council's Food, Health and Welfare program committee and regularly involved in consultancy work for Danish ministries.



UK

Invitation to celebrate

Resistance '15

14th – 16th September 2015



The 7th International meeting on pesticide resistance will be held at Rothamsted Research, Harpenden, Herts, UK

It will include the latest work on resistance to insecticides, fungicides and herbicides

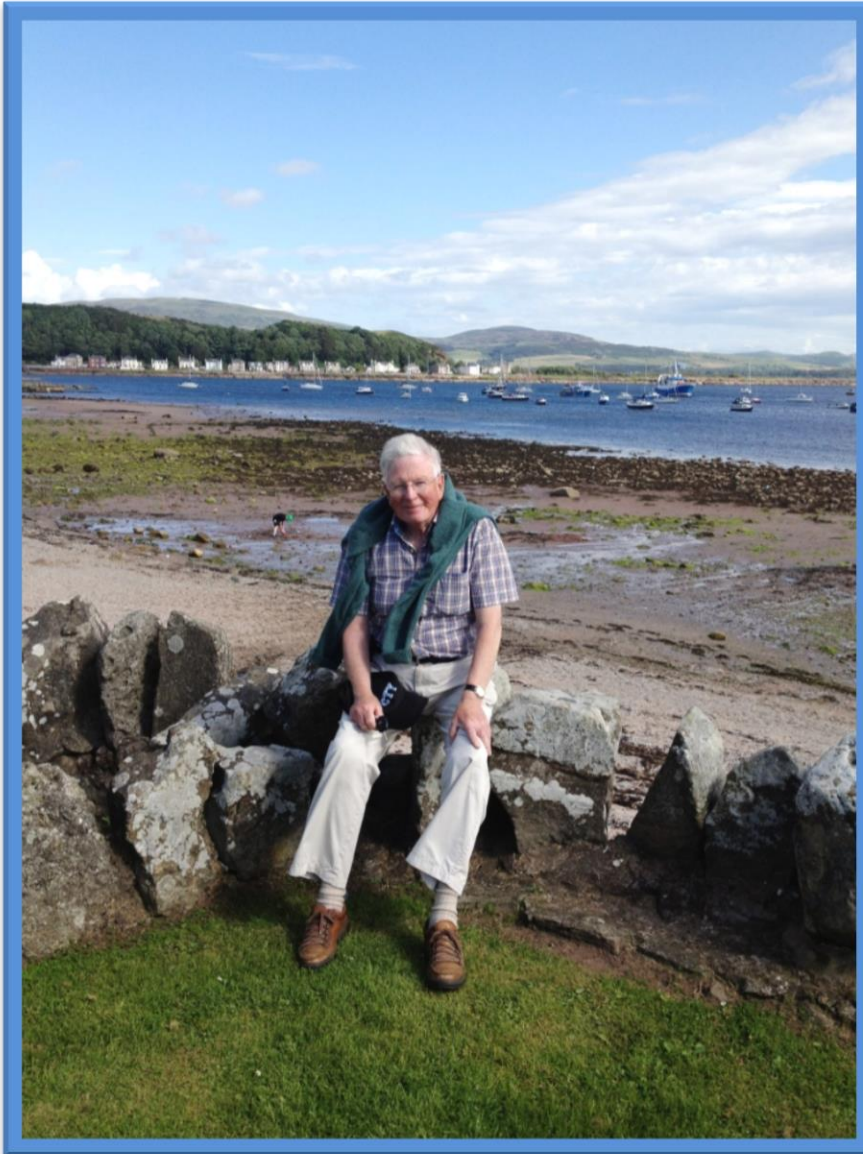


OBITUARIES

An Appreciation: Dr Ralph C Kirkwood, Ph.D, D.Sc. F.R.S.E. – 06.07.1934-16.06.2014

Dr Ralph C Kirkwood: Botanist, Educator and International Enthusiast

Ralph Kirkwood who died in June aged 80 was a very special botanist characterized by the breadth and depth of his impact on academic, social and environmental matters. In the wonderful world of weeds he was known for his prodigious output of publications on plants, physiology, herbicides and weed control. His career at the University of Strathclyde, Glasgow illustrated his love of botany that was developed, shared and sustained with others through his skills as a lecturer, researcher and community leader.



Publications, collaborations and conference appearances led many students from all across the world to seek supervision with Ralph Kirkwood. The impact of his enthusiasm for knowledge and academic endeavor grew on the international stage via the successful supervision of over 35 post-graduates. His research of practical, economic and academic value was further recognized by his peers. Ralph was a recipient of International Weed Science Society Fellow award in 1996 (see the career review for RCK - IWSS newsletter September 2013).

Ralph Kirkwood was an accomplished communicator, mentor and loving family man. Beyond his academic life, he gave untiring support to community organizations, the church, fellow mariners and all around him. His humor shone through to bring joy to others. His personality was warm, caring and always exemplified a 'real

gentleman'. Living in Ayr (Scotland), Ralph had a wonderful affinity for the countryside, the coast and enjoyed sharing this passion with others.

Ralph, a very special botanist is survived by his wife Mair (married for 54 years), sons David, Andrew and Gareth and six grandchildren Jamie, Ross, Nicolas, Alistair, Calum and Victoria.

-Prof. George Marshall, Emeritus Professor, Scotland's Rural College (SRUC), Edinburgh, Scotland, UK

In Memory of Maria Olofsdotter

On August 2nd, **Maria Olofsdotter** died at the age of 56. Maria was a native to Sweden, but she lived most of her life in Denmark. After being a student at the Swedish Agricultural University, she earned her master degree at the then Royal Veterinary and Agricultural University (KVL) in Copenhagen Denmark in 1987. After working in the Veterinary and Agricultural Research Council for two years she commenced her PhD studies in Weed Science at KVL. She later became a post doc and assistant and



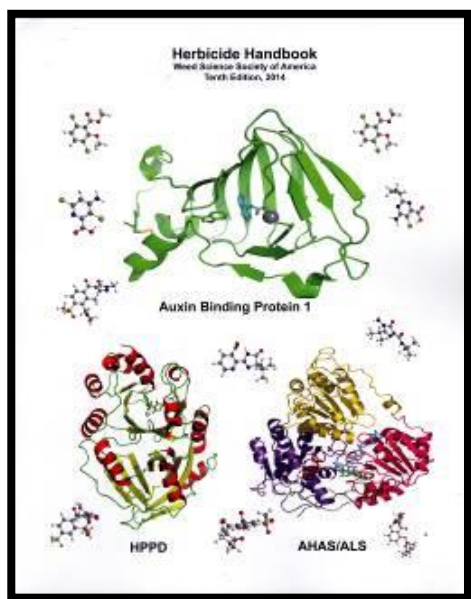
associate professor in Weed Science. From 1994- to 2000 she was a Weed Scientist and Senior Scientist at the International Rice Research Institute (IRRI) in the Philippines. Her international perspective and dedication to allelopathy in rice resulted in more than a dozen heavily cited papers. The years at IRRI were extremely productive and her leadership and diligence in the allelopathy research in rice was unparalleled. Upon returning to Denmark she started a new career as coordinator in a Danish Swedish research network and became deputy director for the Øresund Science Region. As was the case with the important work in Rice, she also left her noticeable footprint as an international coordinator between Sweden and Denmark. She is survived by her two children, her husband and her father. She will be greatly missed.

Professor Jens C Streibig, Professor of Weed Science, The University of Copenhagen, Taastrup, Denmark.

NEW BOOKS

10th Edition of Herbicide Handbook

Published by Weed Science Society of America, Cost \$95 including S&H



The 10th edition of the WSSA Herbicide Handbook is completely revised and updated in a new easy-to-use alphabetical format. It contains detailed information on more than 230 herbicides currently in commercial production and includes a handy reference glossary of technical terms and listings of adjuvants. It is a perfect resource for teachers, students, researchers, industry representatives, government officials, and weed control specialists.

RECENT ADVANCES IN WEED MANAGEMENT

Chauhan, Bhagirath S and Mahajan, Gulshan (Eds.), 2014, XI, 411 p. 36 illus., 23 illus. in colour., Hard cover **169,99 €**, eBook, **142,79 €** ISBN 978-1-4939-1019-9,

The book addresses the role of weed seed ecology in improving weed management, provides different weed management strategies relative to conservation agriculture, helps extension staff strengthen their role. This volume addresses recent developments in weed science. These developments include conservation agriculture and conservation tillage, climate change, environmental concerns about the runoff of agrochemicals, resistance of weeds and crops to herbicides, and the need for a vastly improved understanding of weed ecology and herbicide use. The book provides details on harnessing knowledge of weed ecology to improve weed management in different crops and presents information on opportunities in weed management in different crops. Current management practices are also covered, along with guidance for selecting herbicides and using them effectively.

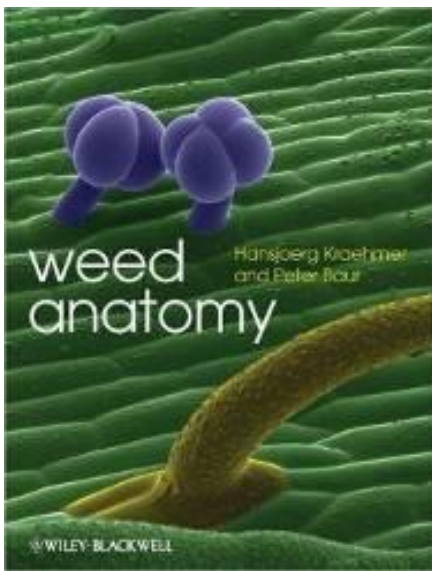
Written by experts in the field and supplemented with instructive illustrations and tables, *Recent Advances in Weed Management* is an essential reference for agricultural specialists and researchers, government agents, extension specialists, and professionals throughout the agrochemical industry, as well as a foundation for advanced students taking courses in weed science.



Weed Anatomy

Kraehmer, Hansjoerg and Baur, Peter

Handbook/Reference Book, Edition April 2013, € 322
502 Pages, ISBN 978-0-470-65986-1 - John Wiley & Sons



Weeds affect everyone in the world by reducing crop yield and crop quality, delaying or interfering with harvesting, interfering with animal feeding (including poisoning), reducing animal health, preventing water flow, as plant parasites, etc. Weeds are common everywhere and cause many \$ billions worth of crop losses annually, with the global cost of controlling weeds running into \$ billions.

The anatomy of plants is generally well understood, but the examples used for explanations in most books are often restricted to non-weed species. Weeds have many features that make them more competitive, for example enabling them to more quickly recover after herbicide treatment. Some of these adaptations include rhizomes, adapted roots, tubers and other special structures. Until now, no single book has concentrated on

weeds' anatomical features. A comprehensive understanding of these features is, however, often imperative to the successful implementation of many weed control measures.

Beautifully and comprehensively illustrated, in full colour throughout, *Weed Anatomy* provides a comprehensive insight into the anatomy of the globally-important weeds of commercial significance. Commencing with a general overview of anatomy, the major part of the book then includes sections covering monocotyledons, dicotyledons, brackens and horsetails, with special reference to their anatomy. Ecological and evolutionary aspects of weeds are also covered and a number of less common weeds such as *Adonis vernalis*, *Caucalis platycarpus* and *Scandix pecten-veneris* are also included.

The authors of this book, who have between them many years of experience studying weeds, have put together a true landmark publication, providing a huge wealth of commercially-important information. Weed scientists, plant anatomists and agricultural scientists, including personnel within the agrochemical and crop protection industry, will find a great deal of useful information within the book's covers. All libraries in universities and research establishments where agricultural and biological sciences are studied and taught should have copies of this exceptional book on their shelves.

AUTOMATION: THE FUTURE OF WEED CONTROL IN CROPPING SYSTEMS

Young, Stephen L. and Pierce, Francis J. (Eds.)

2014, XII, 265 p. 86 illus., 47 illus. in color. Hardcover 139,99 €, eBook 118,99 €

This book shifts the paradigm that weeds can only be controlled using broadcast applications of chemical and mechanical techniques in distinct spatiotemporal scales, also referred to as integrated weed management. In fact, true integrated weed management is more than just diversification of techniques and for the first time could be achieved using advanced technologies. Automated weed control is not the proverbial 'silver bullet', but an entirely new approach in cropping systems where multiple weed control strategies are available for use at the same time.

In an automated system, sensor and computer technologies onboard a robot would first categorize each and every plant in a farmer's field as either weed or crop, and then go on to identify the species of weed. Once those identifications were made, multiple weed fighting strategies located on a single platform could be applied to individual plants based on their biology. If the system identified a weed that's resistant to Roundup™, for example, it could be sprayed with a different herbicide. Or an onboard cutting or flaming micro-tool could be used to kill the plant instead.

The production of a book that addresses weed control of the future will have profound impacts on current and future cropping systems across the globe. To date, no other resource exists on this important and rapidly advancing topic of automated weed control in cropping systems. In the near future, a new approach will be needed for managing weeds, especially with the challenges of weed resistance to herbicides, off-site movement of soil, fertilizers, and chemicals, an increasingly non-agrarian public, labor shortages, economies in recession, and the continued rural to suburban land use conversion. Automation is part of the solution.



PARASITIC OROBANCHACEAE: PARASITIC MECHANISMS AND CONTROL STRATEGIES

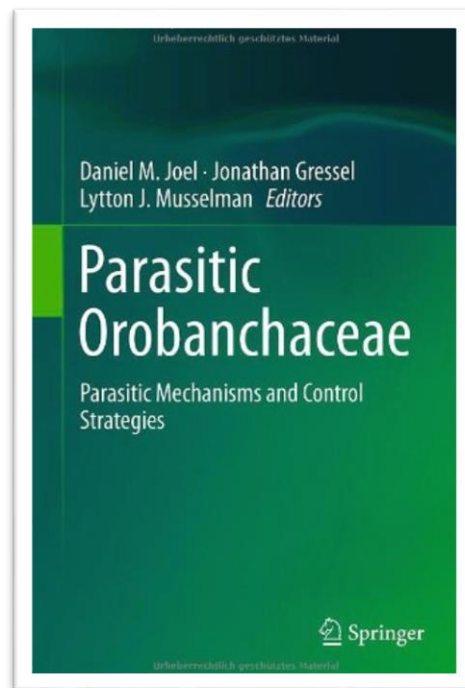
DANIEL M. JOEL (EDITOR), JONATHAN GRESSEL
(EDITOR), LYTTON J. MUSSELMAN (EDITOR), 2013
SPRINGER-VERLAG BERLIN HEIDELBERG HARDCOVER,
513 PAGES, \$191.17

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.

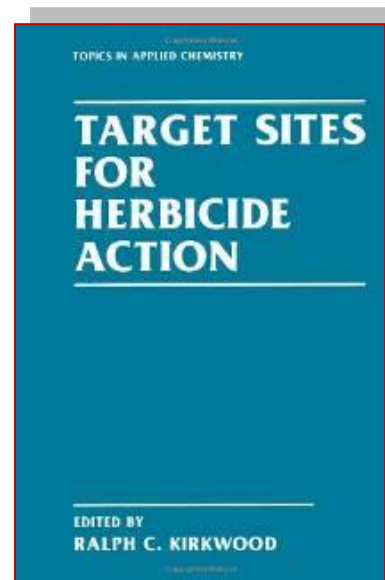


TARGET SITES FOR HERBICIDE ACTION (TOPICS IN APPLIED CHEMISTRY) PAPERBACK – DECEMBER 31, 2013

R.C. Kirkwood (Editor), Price: \$194.45

ISBN-13: 978-1489924353 ISBN-10: 1489924353 Edition: Softcover reprint
of the original 1st ed. 1991

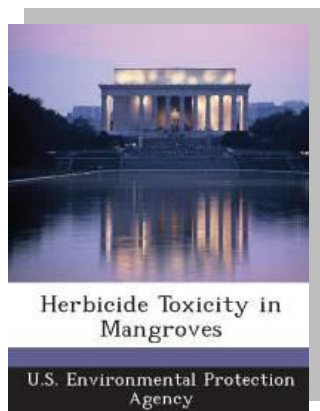
The development of chemicals to selectively control the growth of weeds has been a fascinating success story which has unfolded largely during the last four decades. The dramatic growth of herbicide research that followed the wartime discoveries of the auxin-type herbicides (phenoxyalkanoic acids) resulted in a whole range of compounds and mixtures which are used to eliminate broad-or narrow-leaved weeds from agricultural, horticultural, or forestry crops. Today, the safe use of this armament of compounds requires our understanding of their mode of action, metabolism, and environmental persistence. The most recently developed herbicides are highly effective inhibitors of specific enzyme systems, and formulation may be an important factor determining their efficient delivery at specific target sites. In this book, the major target sites of herbicide action are discussed in Chapters 1-5, with particular reference to photosynthesis; amino acid, lipid, and carotenoid synthesis; and other primary target sites. The effects of synergists or antagonists as modifiers of herbicide action are described in Chapter 6. The importance of efficient target site delivery as a fundamental factor in herbicide activity and selectivity is generally recognized. Delivery of a potentially lethal dose of active ingredient may



depend on a whole range of factors including the efficiency of application, retention, absorption, translocation, immobilization, and detoxification. These aspects are considered in the remaining chapters, with particular reference to the pathways and mechanisms involved in the uptake, translocation, and metabolism of soil-and foliage-applied herbicides.

HERBICIDE TOXICITY IN MANGROVES

U. S. Environmental Protection Agency, Paperback 46 p, \$13.96, March 20, 2013



The U.S. Environmental Protection Agency (EPA) was introduced on December 2, 1970 by President Richard Nixon. The agency is charged with protecting human health and the environment, by writing and enforcing regulations based on laws passed by the Congress. The EPA's struggle to protect health and the environment is seen through each of its official publications. These publications outline new policies, detail problems with enforcing laws, document the need for new legislation, and describe new tactics to use to solve these issues. This collection of publications ranges from historic documents to reports released in the new millennium, and features works like: Bicycle for a Better Environment, Health Effects of Increasing Sulfur Oxides Emissions Draft, and Women and Environmental Health.

MALEZAS E INVASORAS DE LA ARGENTINA TOMO I: ECOLOGÍA Y MANEJO [Weeds and Invasives of Argentina Volume I: Ecology and Management] Osvaldo A. Fernández, Eduardo S. Leguizamón, Horacio A. Acciaresi (Eds.)

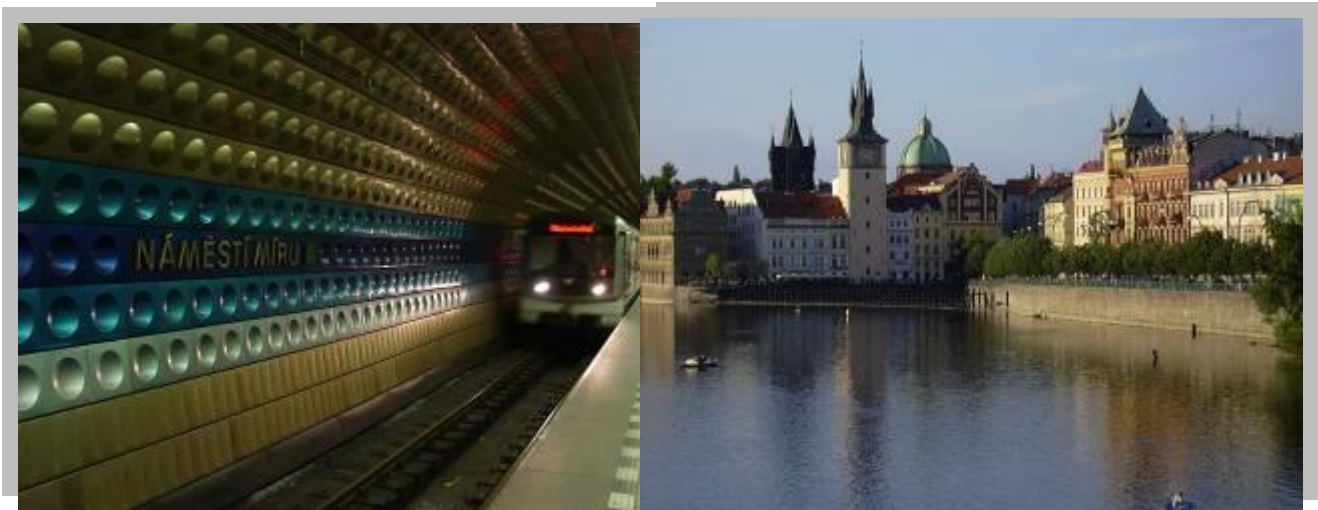
ISBN N° 978-987-1907-70-0 945 p. 1950 Kg - Editorial Universidad Nacional del Sur, Argentina. March 2014, in Spanish

It has been more than 30 years since the last edition of the well-known book by Angel Marzocca "Manual de Malezas". This is an updated reference book that incorporates most of the available knowledge in Argentina on weeds and their management in the different production systems. The work will be, indeed, a relevant contribution for academia and practitioners. Volume I deals with endemic and invasive weeds in agro-ecosystems, from general aspects of biology and plant population dynamics to the more specific topics of weed management in crops, prevention of invasions, population dynamics models, herbicide persistence, biological control and others. Two more volumes are in preparation: Volume II will be on weed identification and classification, and Volume III will summarize knowledge on biology and management of weeds in Argentina. To acquire this Volume I, one must contact: María José Palazzesi. Secretaría Financiera (Edificio Central, 2 Piso, Oficina 18). Zavalla. Santa Fe; pone: +0341-4970080/085, extension 1103; e-mail: financiera-agr@unr.edu.ar.



Welcome to Prague, Czech Republic for 7th IWSC, 19-25 June 2016

Prague is a magical city of bridges, cathedrals, gold-tipped towers and church domes mirrored in the surface of the swan-filled Vltava River for more than ten centuries. Unscathed by WWII, Prague's medieval centre remains a wonderful mixture of cobbled lanes, walled courtyards, cathedrals and countless church spires all in the glorious shadow of her majestic 9th century castle that looks eastward as the sun sets behind her. Prague can also boast for a modern and vibrant city full of liveliness, music, cultural art, mouthwatering culinary cuisine, and entertaining tourists thirst for adventure and enjoyment. Prague is one of Europe's most charming and beautiful cities, Prague has become the most popular travel destination in Central Europe along with Bratislava and Krakow. Millions of tourists visit the city every year. Prague was founded in the later 9th century, and soon became the seat of Bohemian kings, some of whom ruled as emperors of the Holy Roman Empire. The city thrived under the rule of Charles IV, who ordered the building of the New Town in the 14th century - many of the city's most important attractions date back to that age. The city also went under Habsburg rule and became the capital of a province of the Austro-Hungarian Empire. In 1918, after World War I, the city became the capital of Czechoslovakia. After 1989 many foreigners, especially young people, moved to Prague. In 1992, its historic centre was inscribed on the UNESCO World Heritage List. In 1993, Czechoslovakia split into two countries and Prague became capital city of the new Czech Republic" (Source: <http://wikitravel.org/en/Prague>)



Prague Metro

Prague east bank

-Sourced from the web (Secretary, IWSS)

OTHER MAJOR UPCOMING EVENTS

2014

- September 1-4, 2014 XXIX Brazilian Weed Science Congress "Weed Science in a Climate of Change" Serrano Resort, Convention and Spa, Gramado, Brazil, Contact person: Fabiane Lamego, Federal University of Pelotas, Brazil, Email:fabilamego@yahoo.com.br
- September 1-4, 2014 19th Australasian Weeds Conference at the Hotel Grand Chancellor 'Science, Community and Food Security: the Weed Challenge'. CONTACT: Leishman Associates, www.leishman-associates.com.au Ph: +61 3 6234 7844, F +61 3 6234 5958, E: naomi@leishman-associates.com.au, <http://australasianweeds2014.com.au/>
- September 9-12, 2014 5th International Symposium of Biofumigation, Harper Adams University Matthew Back - Harper Adams University (conference coordinator), <http://www.aab.org.uk>, <http://www.aab.org.uk/contentok.php?id=160&basket=wwshowconfdets>,
- September 10, 2014 Herbicide Resistance Summit II, Washington D.C. Contact for reservation 888-874-0100 and 490303. <http://wssa.net/meeting-registration/>
- September 24-26, 2014 International Symposium on Conservation and Management of Pollinators for sustainable agriculture and Ecosystem Services - ISCMP2014, NASC Auditorium, ICAR, PUSA, New Delhi, India. Contact: Dr. V. Sivaram, www.eventm.net/iscmp2014
- October 27-31, 2014 The 4th International Rice Congress (IRC2014), Bangkok (Thailand) Conference Secretariat: PICO Building, 10 Soi Lasalle 56, Sukhumwit Bangna, Bangkok 10260, Tel: +6627487881 | Fax: +662 7487880 | E-mail: info@ricecongress.com
- October 28-29, 2014 Developments in hand-held application techniques, School of Agriculture, Universitat Politecnica De Catalunya, Barcelona, Spain, Contact: AAB Office, Warwick Enterprise Park, Wellesbourne Warwick CV35 9EF, UK, Tel: +44 (0)2476 574998; Fax: +44 (0)1789 470234; Email: John@aab.org.uk, <http://www.aab.org.uk>
- November 1-3, 2014 Asian Plant Science Conference, Hotel Nirvana, Lumbini, Nepal. Contact: Dr. Devarajan Thangadurai, UAS Dharwad, Karnataka, Tel. +91 9482685270/ 9480546195, Email: drthangaduraid@gmail.com/ thanga@aabs.org.in
- November 19-20, 2014 Advances in IPM 2014 at Olde Barn Hotel, Marston, Lincs, UK, Contact: AAB Office, Warwick Enterprise Park, Wellesbourne Warwick CV35 9EF,

UK, Tel: + 44 (0)2476 579195 Fax: +44 (0)1789 470234: E-mail: John@aab.org.uk, http://www.aab.org.uk/images/ipm_2014_pro.pdf

- December, 9-10 2014 Challenges for Crop Production and Quality - Annals of Applied Biology Centenary conference at: Rothamsted Research, Harpenden, Herts, UK, <http://www.aab.org.uk/contentok.php?id=168&basket=wwshowconfdets>
- October 14–17, 2014 Weeds Across Borders (WAB) Ottawa, Canada. For details: http://wssa.net/wp-content/uploads/Weeds-Across-Borders-2014_Call-for-Abstracts.pdf
- November 17-21 2014 5th Workshop of the EWRS working group weeds and biodiversity. Local organisers; Paolo Bàrberi, Camilla Moonen, Federica Bigongiali, Gionata Bocci, Stefano Carlesi. (http://www.ewrs.org/weeds_and_biodiversity.asp).
- November 03-08, 2014 NEOBIOTA 2014, 8th International Conference on Biological Invasions, Biological Invasions, Antalya-Turkey. For scientific queries please contact Professor Ahmet ULUDAG @ahuludag@yahoo.com. For administrative queries please contact Ms Tugba HELVACIKARA attugba@ssc.com.tr, <http://neobiota2014.org/>
- November 18-22, 2014 2nd International Conference on Advances in Plant Sciences, Four Points by Sheraton, Kuching, Sarawak, Malaysia, Contact: sivaram900@gmail.com, www.icaps2014.com, www.plants2014.com, AAB Office, Warwick Enterprise Park, Wellesbourne Warwick CV35 9EF, UK, Tel: +44 (0)2476 574998; Fax: +44 (0)1789 470234; Email: John@aab.org.uk
- December 9–11, 2014 Sustainable Intensification - Annals of Applied Biology Centenary conference, Venue: The Olde Barn Hotel, Marston, Lincs, UK, President: Professor Peter Shewry, AAB Office, Warwick Enterprise Park, Wellesbourne Warwick CV35 9EF, UK, Tel: +44 (0)2476 574998; Fax: +44 (0)1789 470234; Email: John@aab.org.uk, <http://www.aab.org.uk/contentok.php?id=168&basket=wwshowconfdets>

2015

- February 9–12, 2015 55th Annual Meeting of Weed Science Society of America, Hilton Lexington Downtown and Lexington Convention Center, Lexington, Kentucky. Contact: Dallas Peterson, Chair, Email: dpeterson@ksu.edu, Phone: 785-532-0405. www.wssa.net
- March 11-13, 2015 The French Association of Plant Protection (AFPP) will organize 5th International Conference on Alternative Methods of Crop Protection at

Lille, France. Contact: AFPP - 42 rue Raymond Jaclard - F-94140 ALFORTVILLE, FRANCE, Ph +33(0) 1 41 79 19 80, Fax. +33(0)1 41 79 19 81, Email: afpp@afpp.net, Website: www.afpp.net

March 23–26, 2015 8th INTERNATIONAL IPM SYMPOSIUM “IPM—Solutions for a Changing World” Salt Lake City Utah USA at the Salt Palace Convention Center. Contact Elaine Wolff (wolff1@illinois.edu) exhibiting at or contributing to the Symposium, see: <http://ipmcenters.org/ipmsymposium15>.

June 23-26, 2015 17th EUROPEAN WEED RESEARCH SOCIETY SYMPOSIUM, Montpellier SupAgro, France, Weed management in changing environments, Contact: Henri DARMENCY, INRA, UMR1347 Agroécologie, 17 rue Sully, Bat. Coste, BP 86510, 21065 Dijon, France, Tel: 33 (0)380 693186, Fax: 33 (0)380 693 262, e-mail:ewrs2015@dijon.inra.fr

Aug. 24-27, 2015 XVIII, International Plant Protection Congress. Mission possible: food for all Through Appropriate Plant Protection. Free University Berlin, Garystraße 35, 14195, Berlin-Dahlem/Germany, Contact. Dr. Bernd Holtschulte, Vice President German Phytomedical Society, www.fu-berlin.de/hfb

September 9-10, 2015 XXII Congreso Latinoamericano de Malezas (ALAM), I Congreso Argentino de Malezas (ASACIM) [21st Latin American Weed Congress (ALAM) and 1st Argentinean Weed Congress (ASACIM)]. Contact: Elba de la Fuente, Profesora Asociada, Cátedra de Cultivos Industriales’ Departamento de Producción Vegetal, Facultad de Agronomía – UBA, Av. San Martín 4453, (C1417DSE) Ciudad Autónoma de Buenos Aires, ARGENTINA Tel 54-11-4524-8075/8040 int. 41, FAX No. 54-11-4514-8737/54-11-4514-8739 CEL No. 54-11-1554242939, Email:asacim.malezas@gmail.com

Sept. 14–16 2015 Resistance 15; The 7th International meeting on pesticide resistance, Rothamsted Research, Harpenden, Herts, UK Contact: Paul Neve, paul.neve@rothamsted.ac.uk, e-mail rres.resistance@rothamsted.ac.uk, www.rothamsted.ac.uk/Resistance2015

October 13-16, 2015 25th Asian Pacific Weed Science Society Conference on Weed Science for Sustainable Agriculture, Environment and Biodiversity ANGRAU Hyderabad, India, Contact: Dr. N. T. Yaduraju, President APWSS, Tel. +91 7893982456, email: nyaduraju@gmail.com

2016

Feb. 2016 Weed Science Society of America Annual Meeting, San Juan, Puerto Rico, www.wssa.net

June 19-25, 2016 7th International Weed Science Congress, Clarion Congress Hotel Prague, Prague, Czech Republic. Contact: Dr. Josef Soukup, Tel. +420 22438 2780, E-mail: soukup@af.czu.cz, iwsc2016@guarant.cz, <http://www.iwss.info/iwsc.php>

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The IWSS Newsletter is available on the Internet at:
<http://www.iwss.info/newsletters>

The Newsletter is published twice a year to foster communication among and give information to our members and others around the globe interested in Weed Science.

Thanks to the contributors who helped with the present issue. We would love to hear activities in your areas; please contribute and share with all weed science fraternity.

**Deadline for items for the next Newsletter is
15 March 2015**

Editor: **Dr. Samunder Singh**

Department of Agronomy,
CCS Haryana Agricultural University, Hisar 125 004, India
Email: sam4884@gmail.com, Voice: 91 94160 07242

TO JOIN THE IWSS

Complete the following information and send your dues to
Dr. Franck Dayan, the IWSS Treasurer:

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Membership Form is also available at Society's website.
Annual membership is from January to December.
Checks, bank drafts or money orders in US\$ should be made
payable to: International Weed Science Society
For ease of payments, dues can now be paid by credit card at
our webpage by following the link:
<http://www.iwss.info/membership.asp>