



IWSS Newsletter Sept. 2010

President's Message

Dear friends,
I am glad to inform you that during the last few months we made good progress in the preparations for the IWSS Congress in Hangzhou, China. The local organizing committee headed by Prof. Xian C. Zhang (cxzhang@wssc.org.cn) has signed the agreement with the hotel and is working on all other organizational aspects.



The Scientific Program Committee (SPC) was established and we are discussing and planning major aspects of the upcoming Congress via tele-conference calls. The First Circular for the Congress was recently e-mailed to all of you and is also available at the Society's web page. The SPC, headed by Per Kudsk, the Past President of the EWRS, together with active weed scientists from around the world, will develop the scientific program together with you – IWSS members. We invite all of you to offer subjects and issues you want to see included in the program and send your ideas to the SPC chairman (per.kudsk@agrsci.dk). We are confident that with your active participation and support the program will be attractive to audience from all sectors including academia, industry, extension and regulation. We are looking forward to hear from you and see you all in Hangzhou.

I would like also to welcome Dr. Samunder Singh from Haryana Agricultural University, Hisar, India who accepted our invitation to serve as the new Newsletter Editor, and wish him much success. Please send him items and information you want to include in the Newsletter (sam4884@gmail.com).

We also would like to thank the former Newsletter Editor, Dr. Mike Owen, from Iowa State University, USA for his work and devotion. Thank you, Mike, we are confident that you will continue to contribute from your knowledge and experience to the Society in the future.

For the first time, the open IWSS Board meeting took place outside of the US, during the 15th EWRS Symposium in Kaposvar, Hungary where a financial report was presented along with presentation of the Chairman of the SPC, Per Kudsk on the SPC activities. As an international society we intend to organize such open board meetings in all major weed science conferences around the world.

I would also like to inform you that IWSS encourages and supports the active participation of young weed scientists and students in conferences. Three scholarships were awarded to students, who participated in the joint congress of XIX Congreso Asociacion Latinoamericana de Malezas/XII Congreso de la Sociedad Espanola de Malherbologia/Congreso Iberoamericano de Ciencia de las Malezas which took place in Lisbon, Portugal. IWSS also supported the participation of three students in the 22nd Asian-Pacific Weed Science Society (APWSS) Conference in Lahore, Pakistan. We encourage those of you who organize regional or national weed conference to contact IWSS for any needed assistance including help in recruiting speakers from our society for teaching in short courses or other special events.

We are looking forward to hear from you all and have your suggestions for novel ideas and relevant topics for the scientific program.

With my best wishes for a fruitful season ahead.

Baruch Rubin
President of IWSS
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THE VITH INTERNATIONAL WEED SCIENCE CONGRESS

The 6th International Weed Science Congress will be held in Hangzhou, China from June 17-22, 2012 jointly organized by The Institute of Plant Protection (CAAS), The China Society of Plant Protection and Weed Science Society of China (CSPP).

The theme of the Congress will be **‘Dynamic weeds, diverse solutions’**. The scientific programme will consist of invited keynote presentations, discussion sessions on topical issues, educational sessions led by distinguished scientists, and oral and poster sessions based on offered contributions. One of the five congress days will be used for field excursions.

The scientific programme committee is dedicated to developing a programme with a truly global scope that will be attractive to scientists as well as graduate students in Weed Science and related disciplines. We, therefore invite you to send us ideas for specific sessions (for example, within innovative and emerging research areas). Send your suggestions to Per Kudsk, Chairman of the Scientific Programme Committee. (Per.Kudsk@agrsci.dk). We will regularly upload the suggestions we receive to the IWSS webpage (www.iwss.info). The second circular that will be released in June 2011 will contain the full list of sessions and a call for abstracts.

The official language of the Congress is English. All abstracts and papers should be submitted and presented in English. On request, an invitation can be arranged for participation. The invitation is only to help participate, to raise travel funds or to obtain a visa, and is not a commitment on the part of the organizers to provide any financial support. A visa is required for participants from most countries. Upon receiving the registration form and payment, the Local Organizers could send the official invitation letter for visa to the registered participant. With the invitation letter, the participant may apply for visa at the Chinese Embassy or Consulate General in his/her country.

The weather in Hangzhou in June remains warm during the day and night and mostly sunny. The temperatures range from 28-37°C.

Participants from most countries can fly into either Beijing, Shanghai, or Hong Kong, and make a transfer to Hangzhou. Participants may also fly directly into Hangzhou (Xiaoshan International Airport); please check for updates on the website.

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Recent Events and News of Interest

UK

Rothamsted Scientist received top award from the Royal Agricultural Society of England

Dr. Stephen Moss, one of Britain's leading authorities on herbicide resistance has worked at Rothamsted Research, an institute of the Biotechnology and Biological Sciences Research Council (BBSRC) for the past 19 years. Dr. Stephen Moss was presented with the prestigious RASE Technology Award at the Royal Show Charity Dinner on Tuesday 7th July for the development of



the Rothamsted Rapid Resistance Test, which provides a simple method of diagnosing resistance to herbicides in arable weeds. It has been used extensively in practice in the UK and overseas and has had a major impact on weed control in agriculture. The award recognises those who have developed a product or process that makes a big impact in changing agricultural practice. Dr. Moss

said “I am honoured to receive such an important award, especially one that is dedicated to recognising science that has had a major influence on the practice of agriculture. I am very lucky to have worked with an excellent team of scientists over the years and this also recognises their contribution.”

Professor Ian Crute said “This is well-deserved recognition for a scientist who has always taken an industry-oriented view of his science. In the UK arable crops industry he is probably Rothamsted's best-known practising scientist - known by some as "Saint Stephen" for the value that they attribute to his work on blackgrass resistance management.”

Award-winning test for herbicide-resistance detection

A rapid way of testing how far weeds have become resistant to herbicides is a crucial tool in enabling arable farmers to minimise and manage resistance. The Rothamsted Rapid Resistance Test was devised by Dr. Stephen Moss in 1999, and has been progressively refined and revised since, as new herbicides are developed. The test is now deployed extensively as a ‘standard’ by organisations and companies across the UK, and more widely, and has informed new strategies for preventing, designating and managing herbicide-resistance.

Grass weeds such as blackgrass, ryegrass and wild oats cause serious problems for arable farmers. Resistant forms of the weeds occur significantly in fields where herbicides have been used regularly. For example, resistant blackgrass has been found on over 2000 farms across 32 English counties. Dr. Moss and colleagues have characterised four-categories to describe the severity of resistance. This provides a standard framework for monitoring resistance and for ensuring that farmers receive the most appropriate advice. This is particularly important as the threat from resistant weeds is likely to increase with increased sowing of winter crops, less tillage and the withdrawal of some herbicides on environmental grounds and their replacement by those with a higher risk of triggering resistance. Crucially, the Rothamsted test can alert farmers for resistance to new or ‘low resistance risk’ herbicides before problems become apparent in the field. This enables them to take early action to contain the resistance problem.

Stephen.Moss@bbsrc.ac.uk



Weed Research report

The Editor-in-Chief of the journal *Weed Research*, Dr. Jon Marshall, gave a report at the recent 15th EWRS Meeting in Kaposvár, Hungary. The upbeat message for the European Weed Research Society and contributors was that the journal's ISI Impact Factor had climbed to 2.033. Celebrating the journal's 50th volume, he reported that the increase in citations has continued in the recent years, achieving a record 300 submissions in 2009, including those for the first Supplement to the journal on Parasitic Weeds. The Editor drew attention to the international nature of the journal's contributors, the Editorial Board, chaired by Paul Hatcher, and the reviewers used by Subject Editors. More than 300 reviewers from over 30 countries helped authors and the journal during 2009. Thanking all present and past members of the Editorial Board, reviewers and contributors, Jon Marshall invited all weed scientists to consider submitting their original research, reviews or topical insights papers to *Weed Research*.

Contacts:

E-mail the Editor-in-Chief:

jon.marshall@agroecol.co.uk

Journal submission and review:

<http://mc.manuscriptcentral.com/wre>

Journal information and Author Guidelines:

<http://www.wiley.com/bw/journal.asp?ref=0043-1737>



MEXICO

**WSSA Liaison Mexican Weed Science Society
(ASOMECEMA) – Albert Fischer**

2009-2010 Activities

The following are weed science activities I attended in Mexico in my dual role of WSSA Liaison for ASOMECEMA and representative (Vice-President) of the International Weed Science Society (IWSS):

On July 20 to 22, 2009 an International Course on Resistance to Herbicide in Weeds and Crops was organized by The Plant Protection Department (Departamento de Parasitología Agrícola) of the

Autonomous University Chapingo (Universidad Autónoma Chapingo) in Chapingo near Mexico City. The following lectures were presented at this event:

Dr. Bernal Valverde (WSSA), University of Copenhagen, Denmark

- Evolution of Herbicide Resistance in Plants (historic and world-wide overview)
- What is the Future in Chemical Weed Control?

Dr. José A. Domínguez Valenzuela, Dpto. Parasitología, Autonomous University Chapingo

- Mode of Action of Herbicides

Dr. Albert Fischer (WSSA), Plant Sciences Dept., University of California-Davis

- Methodologies for Studying Herbicide Resistance (Detection and Assessment)
- Herbicide Resistance in Weeds: Prevention and Management

Dr. Fernando Urzúa, Dpto. Parasitología, Autonomous University Chapingo

- Herbicide Resistance management in Mexico

Dr. Enrique Rosales Robles, INIFAP, Río Bravo, Tamaulipas

- Herbicide Resistant Crops (World overview, Problems and Perspectives)

Dr. J. Antonio Tafoya

- Display and Discussion of Herbicide Resistance Bioassays in the Greenhouse

Dr. J.A. Domínguez Valenzuela, Dr. F. Urzúa, Dr. A. Bolaños, Dr. J.L. Medina, and Dr. G. Mondragón.

- Field Plots on Herbicide Mode of Action: Display and Discussion.

The course was attended by an audience of about 100 people comprising a wide assortment of scientists from Mexican universities, public and private institutions, scientists from neighbouring countries, and a large number of students. The presentations were assembled in a CD; contact:

Dr. José Alfredo Domínguez Valenzuela

Universidad Autónoma Chapingo Departamento de Parasitología Agrícola Chapingo CP56230

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On October 21 to 23, 2009, The Mexican Weed Science Society (ASOMECEIMA) held its XXX Congress in the city of Culiacán, State of Sinaloa. Three Symposia were held in conjunction with the meeting:

The VI International Symposium on Aquatic Weeds, The II International Symposium on Herbicide Resistance, and The II Symposium on Weed Science Teaching

I was invited to present a Lecture on Mechanisms of Herbicide Resistance in Plants. WSSA Fellow Dr. Roberto Antonio Aréval also presented a keynote speech. Abstracts and some full papers for the keynote lectures, oral presentations, and posters have been compiled in a CD; contact:

Dr. Germán Bojórquez
germanbojorquez@yahoo.com

At the Congress the new ASOMECEIMA Board of Directors was renewed and the **new President** of the Society is:

MS. Gloria de los Angeles Zita Padilla
asomecima@gmail.com, arvensesunam@gmail.com
Universidad Nacional Autónoma de México,
Cuautitlán, México.

The web page of ASOMECEIMA is at:
<http://www.asomecima.org/congresos.php>

The next ASOMECEIMA meeting will be at the XXXI Mexican Congress of Weed Science to be held on 10 to 12 November 2010 in Cancún, State of Quintana Roo.

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On June 21 to 23, 2010, a short course on Resistance to Herbicide in Weeds and Crops was organized by The Plant Protection Department (Departamento de Parasitología Agrícola) of the Autonomous University Chapingo (Universidad Autónoma Chapingo) in Chapingo near Mexico City. The event was similar to that in 2009, but the panel of lecturers was expanded. WSSA was represented by invited Speakers Dr. Albert Fischer and Bernal Valverde and Ian Heap (Weedsmart,

Corvallis, OR). Dr. Reid Smeda (Missouri State University) had also been invited but could not attend. In addition to other speakers present in 2009, Drs Rafael De Prado (University of Córdoba, Spain) and Nelson Espinosa (INIA Chile) were also invited speakers.

Full papers were compiled in a publication: “Resistencia de Plantas a Herbicidas” (in Spanish), which can be obtained from the meeting Coordinator Dr. J.A. Domínguez Valenzuela (address above) or Dr. Andrés Bolaños anboes53@yahoo.com.mx

Future Plans

I will continue my contact and research collaboration with the Weed Science group at the University of Chapingo and Weed Scientists of INIFAP and the National Autonomous University of México. Hopefully, I may also attend the November 2010 meeting. I have currently a Mexican student in my lab and hope to expand the academic and research exchange with Mexican colleagues. I have facilitated contacts with WSSA members for invitation to meetings in Mexico. WSSA members are strongly encouraged to attend ASOMECEIMA meetings and explore opportunities for scientific collaboration and the hosting of joint weed science events. I will be glad to facilitate contacts and interactions.

Albert J. Fischer

WSSA Liaison ASOMECEIMA

Vice-President International Weed Science Society



Dear Editor,

It is a real pleasure to say hello! I also wish to use this opportunity to let you know that from the 20th to the 22nd of July, we held a national short course on “Weeds and Crops Resistance to Herbicides” at the Department of Parasitología Agrícola of the University of Chapingo, State of México, where 60 participants actualized their knowledge and discussed about resistance of weeds to herbicides and the emerging problem of using herbicide resistant crops in Mexico. Weed resistance to herbicides in Mexico is not an emerging problem; it is already a problem, which becomes worse as the use of herbicide-resistant crops increased.

We had the contribution of very important scientists like Albert Fischer (UC Davis and IWSS), Bernal

Valverde (University of Copenhagen, Denmark, and IWSS), Enrique Rosales (INIFAP, ASOMECEIMA, Mexico), and the weed science professors of Chapingo, all working together to put on a program attractive to weed scientists, government officials, and industry research staff. We had both lectures and field activities.

The course was very successful and participants made good comments and suggested this effort should be repeated next year. On this basis, we are planning to launch this course at the international level next year. For us, as a country, it would be great to have some of our scientist friends from WSSA and IWSS sharing their expertise and talent in the next edition of this course, and helping us to prevent and manage this current problem all over Latin America.

These were the main topics during this event:

- Evolution of herbicide resistance
- What is new on chemical weed management?
- Herbicide mode of action
- Herbicide resistance mechanisms
- Methodologies to assess herbicide resistance
- Herbicide resistant crops
- Prevention and management of herbicide resistance

Also, from the 19th to the 23rd. of October, we will be celebrating the 30th anniversary of the Asociación Mexicana de la Ciencia de la Maleza (ASOMECEIMA), our Weed Science Association, in the City of Culiacan, in the state of Sinaloa, on the pacific coast. There will be three symposia: aquatic weeds, herbicide resistance, and weed science education. We are expecting to have a number of international weed science lecturers and participants from different parts of the world. If IWSS or WSSA members wish to participate, just contact the ASOMECEIMA president Dr. German Bojorquez at (asomecima@gmail.com or germanbojorquez@yahoo.com): <http://www.asomecima.org/>

José Alfredo Domínguez, Ph. D.
Course Coordinator & Professor of Weed Science



VENEZUELA

The Venezuelan Weed Congress will be held on 28 and 29 October, 2010 in the city of Barquisimeto, Lara State (VENEZUELA). The scientific committee is composed of Olga Arnaude, Alvaro Anzalone, Castor Zambrano, Jose Mejia, Aida Ortiz and Jose Vicente Lazo. There will be six conference themes: i) Detoxification of herbicides in plants; ii) Dynamics of perennial weeds in Latin America, iii) Influence of water quality on the effectiveness of herbicides, iv) Chemical weed control in horticultural crops, v) Models predicting weed emergence and vi) Management of weeds in direct-seeded rice. The Forum will also present "Perspectives on Venezuela"

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BRAZIL

The 37th Annual Soybean Meeting at the Southern Region in Brazil was conducted in Porto Alegre/RS, on July 21-23, 2009. During this event, the paper titled: Weedy period prior to economic loss (WEEPEL): First evidence in glyphosate resistant soybean developed by the M.Sc. student Emerson Portes and Prof. Ribas Vidal was awarded with the best work presented in the Weed Science section.



The 6th Brazilian Congress on Irrigated Rice was also conducted in Porto Alegre/RS, 11-14 August, 2009. The event integrated technicians and

researchers from Brazil and Mercosul countries. The work titled: Identification of mutation in ALS gene and the resistance mechanism in imidazolinone resistant red rice by SNAP markers developed by M. Sc. Student Ana Roso was awarded with the best work presented in the Rice Weed Section. This work is part of the Master's degree dissertation conducted at UFRGS under orientation by Dr. Aldo Merotto Junior and Dra. Carla Andréa Delatorre.

The XXVII Congress of the Brazilian Weed
Science Society (SBCPD)
Convention Center Ribeirao Preto, Brazil 19-23
July 2010

This July I had the pleasure to attend one of the most interesting scientific meetings -the 27th Brazilian Weed Science Congress (CBCPD) that took place in the city of Ribeirao Preto, SP. The Congress has started with a full day workshop organized by the Brazilian Chapter of HRAC with presentations and discussions led by local and visiting scientists dealing with various aspects of herbicide resistant weeds, their impact on agriculture and their management.

The Organizing Committee chaired by Prof. Robinson A. Pitelli prepared a rich and high quality scientific program with 48 invited oral presentations, short oral presentations, several round table discussions, 769 posters (!!!) and a field trip.



The most fascinating and promising fact was the large number of participants (661) with more than 370 young weed scientists and students and 290

professionals from all over Brazil. Apart from the invited speakers from Australia, Ethiopia, USA, Israel, Denmark and the Netherlands, there were also participants from neighboring countries such as Chile, Uruguay and Argentina.

During a half day field excursion to the local sugar cane experimental station we visited modern molecular sugar cane breeding facilities as well as a unique and newly built phytotron that fits large sugarcane plants. In addition, we were guided to special plots prepared by several chemical companies where their products and recommended weed management practices were demonstrated.

Last but not least, in addition to the excellent scientific program, the organizers offered us an unforgettable and exciting social program and hospitality that only Brazilian can do. Thank you all.

Baruch Rubin



WSSA recognizes Spanish

To promote and broaden the availability of information published in Weed Science Society of America (WSSA) journals, starting in February, 2010, Weed Technology abstracts will be published in both English and Spanish. This action recognizes the rapid advances in Latin American agriculture and is intended to create a more open Society with greater emphasis on making our science available to all who would find utility. Since Weed Technology brings forward original research in applied aspects of weed management and can have immediate applicability, it was chosen as the first of the three WSSA journals to publish Abstracts in Spanish. Based on the success and response to including Spanish Abstracts in Weed Technology, WSSA will consider widening the inclusion of Spanish Abstracts in our other journals, Weed Science and Invasive Plant Science and Management.



A note from Dr. Ricardo Labrada

Dear colleagues:

My assignment with FAO is over this summer with an accomplishment note. You are probably aware that retirement is compulsory in the UN at 62. This means that one page of my life is already written. Retirement from FAO does not mean professional retirement, it is the opposite. I expect to have new work opportunities either in FAO, in other UN agencies or other institutions. It is not a secret that knowledge accumulated in my 18 years of work mainly in developing regions of the world and in tropical and sub-tropical regions is extensive and of great value to researchers, policy makers, and farmers.

Unfortunately what we have done is not enough, poverty increases day by day and to stop it, we need more efforts and financial support. The international community should aim to improve this situation. Poor countries need to diversify their agriculture to reduce food import; they need to improve crop management and this is only possible by improving cropping systems, including weed and pest management. The world needs fewer funds for wars, and much more for peace. Neglected issues of weeds in the developing world continue to be a primary cause of high crop losses. Integrated weed management with rational use of chemicals is the best option. It is easy to say integrated, but difficult to implement. Farmers need assistance to increase productivity and production.

Whoever will replace me on weeds in FAO will have a lot of challenges. I do really wish him or her all the best. It was also my pleasure to work on issues related to methyl bromide phase out. This is an important environmental issue, and it is time to reduce drastically high exemptions for using the fumigant.

While in other institutions of the world, weed science positions are cut, hopefully in FAO this post is kept.

If any of you are interested to contact me, you can do so through my personal e-mail: ricardolabrada@hotmail.com

I wish you all good success in your life and work and good health for you and your families.

Best regards
Ricardo

ECUADOR

The problem of water hyacinth in Ecuador

Ecuador is in the Northwest region of South America, which has a continental and insular part (Galapagos Islands), with a territory of 256,370 km², bordered by Colombia to the north, Peru to the east and south, and the Pacific Ocean to the west. It has a population of 13,710,234. The country has three natural geographic regions: La costa (coastal plain), la Sierra (Andean mountains) and la Selva (Amazon). In Ecuador there are several river systems; one of them is the Guayas River in the south and the Rio Esmeraldas in the north. In the north, the Cayapas River system drains the rain forest. Both northern rivers are navigable by small light craft. The Guayas River system is the largest and most important because it is a commercially developed waterway. The river, above Guayaquil, divides into Daule and Babahoyo rivers. Ecuador uses these rivers for irrigation. Water supply in Ecuador is a problem, even though the country has an average annual rainfall of 1,200 mm. The rainfall distribution is uneven. Some areas are typically arid, receiving only 250 mm rainfall annually, while others receive as much as 6,000 mm.

It is for this reason that in the last 40 years, Ecuador authorities invested a lot in projects to ensure water supply for domestic and agriculture use. The biggest projects were developed in Manabi with the construction of Poza Honda dam, which is able to store 100 million cubic meters of water and La Esperanza dam, both in Portoviejo province, and the biggest one in the country. The Daule Peripa dam was constructed close to Guayaquil, which supplies power to Guayaquil and surrounding areas. These dams are interconnected.

This interconnection called *Sistema de Trasvase Manabí*, enabled the rapid spread of aquatic macrophytes from one dam to another, among them water hyacinth (WH) (*Eichhornia crassipes*) known locally as *lechuguín* (small lettuce). At present huge areas of these dams, and associated rivers, are heavily infested by WH. The total area covered by WH is estimated to be > 7, 000 ha in the three dams of Poza Honda, la Esperanza and Daule Peripa. One hectare of infested area may provide 100 truckloads of wet WH.

From the social point of view, the communities living around the dams have been seriously affected by heavy WH infestations. Because there are no roads, the inhabitants of rural communities use these waterways as transportation routes, which are seriously impeded by the heavy WH infestation. One deleterious consequence of this is people who are seriously ill and needing medical attention cannot be transported to medical centers nor can medical supplies be ferried to the rural communities.

WH is not new in Ecuador, but once the water was dammed, the widespread outbreak of the weed started. Deforestation of surrounding areas led to deposition of rich soil and manure into the dams, eventually causing high nutrient load and eutrophication. All these contributed to population explosion of WH. Heavy infestation has reduced access to these waters as well as its utility and quality. At present there is no choice, but to mechanically remove WH, which uses a lot of labor and nonrenewable energy (fuel). The most common practice is to create a kind of weed covering device anchored to the shores, where the weed mass is compressed to weaken it and later removed mechanically or manually. Most of this task is carried out by paid workers.

WH plants in all dams show signs of the presence of the host-specific weevil *Neochetina eichhorniae*, but *N. bruchi* is not seen, and probably should be brought from the Amazons, reared, and released for effective biological control. Some fungi were also present on the leaves of the weed, which could potentially be utilized as biological control agents.

An integrated approach using mechanical removal with biological control may help to reduce substantially the present stand of WH in these dams of Ecuador. In the Daule Peripa dam partial utilization of removed WH is practiced. The biomass is processed for producing compost. Although this method provides income, it may not solve the problem of WH completely. The extent of the infestation is so widespread in this dam that it seems impossible to remove all infestations, to process it and to utilize further.

Ricardo Labrada
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PAKISTAN

22nd APWSS Conference

The 22nd APWSS Conference held in Lahore, Pakistan from March 8-12, 2010 was sponsored by the Weed Science Society of Pakistan, Khyber Pakhtunkhwa Agricultural University, Peshawar, Pakistan, Government College University, Lahore,



Pakistan, Jaffer Brothers Pak. Ltd., Excel Crop Care Ltd. India and International Weed Science Society. Delegates from 9 countries including Pakistan, USA, Australia, India, Indonesia, Iraq, Bangladesh, Jordan and Sudan participated in the conference. Due to the peculiar security situation in Pakistan, the participants from abroad were hesitant to attend, but the local participation was very encouraging and about 150 abstracts were submitted for oral presentations and about 3/4th of these were presented in the conference. The APWSS Executive Committee granted two full travel awards to the Invited Speakers, Prof. Robert L. Zimdahl, Colorado State University, Fort Collins Colorado and Prof. Jamal R. Qasem, University of Amman, Jordan. A full travel award was also extended to Prof. Haji Baki Bakar of the University of Malaya, Malaysia, who failed to arrive due to visa problems. Discounts in Registration and Lodging were also awarded to many other local and foreign delegates. The last day of the conference, 12th March, was originally devoted to field excursion, but the participants decided instead to visit the Indo-Pak border at Wagha in the late afternoon of the 11th. All participants enjoyed the special Flag hoisting ceremony, which evoked deep emotions from the people of the two countries. Some of the participants rated it as one of the most enjoyable visit of their life.

The 22nd APWSS conference was officially closed by the out-going president Prof. Khan Bahadar

Marwat. Professor Steve Adkins, current President APWSS, invited the participants to the 23rd APWSS Conference in Australia. The conference ended with an award ceremony, a cultural show and gala dinner held at the Government College University, Lahore, Pakistan.

Gul Hassan, Ph.D. (USA)

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AUSTRALIA

WAHRI evolves to AHRI

Please note that from July 1st 2010, WAHRI has evolved to become AHRI (Australian Herbicide Resistance Initiative). Substantial funding will ensure AHRI will be a major research team through 2015.



Please note that very soon we will launch our new AHRI website: www.hri.uwa.edu.au

2013 International Herbicide Resistance Conference, www.globalresistance2013.com.au

Finally, please note for your long term diary that the week of February 18-22, 2013 we will hold here in Perth, an international conference on herbicide resistance in crops and weeds. The website for this conference will be:

GlobalResistanceChallenge-conference@uwa.edu.au

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APWSS Invitation

The Executive Committee of the APWSS invites you to join APWSS, an association of weed scientists with an Asian-Pacific outlook. APWSS was established in 1967 during the first meeting at the Hawaiian Island of Kawai primarily to facilitate the interchange of current weed management information and to promote research in weed science. Initially supported by the University of Hawaii, the biennial conferences have since become major fora by which research results were shared, information disseminated to agricultural researchers, and cooperation, even encouragement, developed from the fellowship that resulted from them.

We have around 600 members in over 25 countries. From the 87 founding members in 1967, the number of participants peaked at around 600 (1989) with the maximum number of countries represented at any one time being 27.



The 23rd APWSS Conference will be held in Cairns, Australia in September 2011. The Sebel Cairns is located in the centre of Cairns, with fabulous harbour and mountain views from spacious rooms and easy access is to the Central Business District and local attractions. Cairns is the international gateway to tropical North Queensland, and carry with pride the mantle of the 'safest tropical city in the world'.

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International Parthenium Weed Network (IPaWN)

We are pleased to announce the creation of the International Parthenium Weed Network (IPaWN) - An International network of expert volunteers devoted to creating awareness about the parthenium weed (*Parthenium hysterophorus* L.) threat, and to share information on how to reduce its adverse

impacts upon agro-ecosystems, the environment and human health.

The Network started up with over 70 members, coming from 25 countries, and we anticipate significant expansion in the coming months as more people join the network. If you are not already a member of the network and wish to join please contact the network coordinator at s.adkins@uq.edu.au

IPaWN was an initiative of the Tropical and Sub-tropical Weed Research Unit (TSWRU), the University of Queensland, Australia in 2009 and with research involvement in three continents, the TSWRU started to develop information packages on the weed and to send it out to more than 25 countries that have or are at threat of having the weed. After an over-whelming positive response to this circulation of information the value of setting up an international network became obvious.

IPaWN's mission is to coordinate and disseminate information regarding the global invasion of parthenium weed, its diverse impacts on agro-ecosystems, the environment and human health, and its management. The goal of the network is to create an online community to support international Collaboration on the parthenium weed problem and its management.

The objectives are: 1) to facilitate the exchange of information about parthenium weed and its management, 2) to link different regional working groups, institutions and other stakeholders with an interest in parthenium weed and its management, 3) to document new out breaks of the weed and to recommend strategies to reduce further spread in those regions, and 4) to identify topics deserving of new research and to provide access to on-line resources such as identification kits, best management practice documents etc.

Meetings of IPaWN are likely to be timetabled to coincide with major international conferences such as those of the International Weed Science Society, the Asian Pacific Weed Science Society and the International Parthenium Weed Management Conferences.

The Australian Parthenium Weed Research Group and the Pakistan Parthenium Research Group will produce a joint 'International Parthenium News'

newsletter (to be published at the University of the Punjab, Lahore). Contributions for the first issue in 2009 are now invited.

The Network contacts are ---Professor Steve Adkins, and Mr Asad Shabbir TSWRU, School of Land, Crop and Food Science, The University of Queensland, St Lucia, 4072, QLD. Australia.

Steve Adkins

1st IOBC International Workshop on Biological Control and Management of *Parthenium hysterophorus*

In 2009 a Working Group on Parthenium weed biological control was formed under the auspices of the IOBC, currently under the convenor ship of Drs R. Muniappan, K. Dhileepan and W. Mersie. The 1st IOBC International Workshop on Biological Control and Management of *Parthenium hysterophorus* is to be held in conjunction with the 8th IOBC International Workshop on Biological Control and Management of *Chromolaena odorata* and Other Eupatorieae, in Nairobi, Kenya from the 1st – 5th November 2010. It will include the USAID-funded IPM-CRSP Partners Planning Workshop for the project ‘Abating the weed (*Parthenium hysterophorus* L.) damage in eastern Africa using integrated, cultural and biological control measures’.

Parthenium weed is spreading in Africa and Asia, causing similar problems to those already experienced in Australia and India, by impacting on agriculture (crops and grazing), biodiversity conservation, human and animal health. Research on parthenium weed and its management has been conducted over several decades in Australia and India. In Africa, awareness of parthenium weed is limited, but currently some research efforts on the impacts and management of this weed are being undertaken in South Africa, Ethiopia and Uganda, through various nationally-supported programmes and/or international initiatives such as USAID IPM, CRSP and GEF/UNEP. Research on this weed is also being undertaken in Pakistan, Bangladesh, Nepal, China, Sri Lanka and Vietnam and research in Australia and India is still ongoing.

The purpose of the upcoming workshop in Kenya is to bring together international researchers working on parthenium, to disseminate information on the weed and its management, to increase collaboration among researchers regionally and globally, to optimise resources for the control of this weed, and for technology transfer (e.g. supply of biocontrol agents to other countries). Additionally, it is hoped that this workshop will raise awareness of parthenium for countries that are at risk or that are in the early stages of invasion.

This workshop will be held in conjunction with the **8th IOBC International Workshop on Biological Control and Management of *Chromolaena odorata* and Other Eupatorieae**, which is organized under the auspices of the IOBC, and will be hosted by CABI. These workshops were initiated in 1988 to facilitate the management and biological control of *Chromolaena odorata* in resource-poor tropical and subtropical countries. In 2003 the scope of the workshop was expanded to include closely related species such as *Mikania micrantha*, while retaining an emphasis on the tropics. Kenya has been selected as the host country for this 8th workshop, the third held in Africa, because *C. odorata* has recently been recorded there and in other countries in East Africa for the first time. This region has been shown to be highly climatically suitable for chromolaena as well as for parthenium. Other species of invasive alien Eupatorieae which could be included in this workshop include *M. micrantha* and *Ageratina adenophora*. Suggestions for discussion on further species (tribe Eupatorieae) are welcome.

For further details of the 1st IOBC International Workshop on Biological Control and Management of *Parthenium hysterophorus*, the Second Announcement and Expression of Interest, please refer to <http://www.arc.agric.za/home.asp?pid=5229> Abstracts are due to be submitted by the end of July 2010.

Lorraine Strathie, Agricultural Research Council –
Plant Protection Research Institute, Private Bag
X6006, Hilton 3245, South Africa, E-mail:
StrathieL@arc.agric.za
Submitted by Dr. Steve Adkins, Australia

THIRD INTERNATIONAL CONFERENCE ON PARTHENIUM

December 8 to 10, 2010, New Delhi
(India)

Professor (Dr) R.D. GAUTAM
Organizing Secretary, ICP-2010
New Delhi- 110012, India

profgautam@gmail.com, ramdass.gautam@yahoo.com

Software Recently Published for the Identification of Invasive Plants in Australia

Invasive plants threaten the natural environment and biodiversity of Australia, as well as causing significant losses to agricultural production and negatively impacting on human health. The ENVIRONMENTAL WEEDS OF AUSTRALIA DVD is an interactive software product intended to serve as a comprehensive tool for the identification of weed species that invade natural habitats in this country. Recently published by the Centre for Biological Information Technology (CBIT) in the Faculty of Biological and Chemical Sciences, this product was developed here in the School of Land, Food and Crop Sciences as part of the Education Program of the former Cooperative Research Centre for Australian Weed Management.

ENVIRONMENTAL WEEDS OF AUSTRALIA uses the *Lucid3* software platform and contains a massive database of more than 1,000 invasive plant species. It offers detailed descriptions of these weeds, links to relevant website information, a search engine, a cross-linked glossary and thousands of full colour images. The resource was compiled by Dr. Sheldon Navie under the supervision of Prof. Steve Adkins.

This product, which took four years to develop, is the latest in a series of *Lucid*-based weed identification tools produced by Dr. Navie and Prof. Adkins. It is the culmination of more than ten years of work, starting with a much smaller key to the Suburban and Environmental Weeds of south-east Queensland (published in 2002). These tools are used by a wide variety of land managers (e.g. bush care and land care groups, local and state government officers, farm managers and home gardeners) as well as students at university and high school level.

For more information visit the CBIT website at:
<http://www.cbit.uq.edu.au/software/envioweeds/>.
or contact Sheldon Navie at s.navie@uq.edu.au.

NEW ZEALAND

The NZ Committee on Pesticide Resistance

New pesticide Mode of Action/Activity Group Codes are now available as a PDF on the New Zealand Plant Protection Society web site:

www.nzpps.org/resistance/pdfs/moa_codes.pdf.

These can be reached from the NZPPS home page by clicking on "Pesticide resistance" and then "Mode of action/activity group codes". The New Zealand Committee on Pesticide Resistance (NZCPR) has compiled a list of all pesticide active ingredients used in crop protection in New Zealand, grouped by shared resistance risk. The group codes are intended for use on pesticide labels to help in the prevention and management of pesticide resistance. Information used in constructing these tables came from publicly available information from the Fungicide Resistance Action Committee (www.frac.info), the Insecticide Resistance Action Committee (www.irc-online.org), the Herbicide Resistance Action Committee (www.hracglobal.org) and CropLife Australia (www.croplifeaustralia.org.au).

NZCPR recommends that for any product that contains an active ingredient at risk from resistance development, the product label should include a statement about resistance prevention or management. This statement should begin with the mode of action or activity group(s) of the at-risk ingredient(s), as in the following example: "Product X contains the GROUP 16 insecticide, buprofezin. Do not use another product containing an insecticide in the same group in conjunction with Product X when applying the resistance prevention or management guidelines below. [Details of the resistance guidelines for this product then follow]".

If you would like further information please contact Dr. Rob Beresford (Chairman of NZ Committee on Pesticide Resistance) on Robert.Beresford@plantandfood.co.nz

INDIA



Crop World 2010 INDIA was held on 25-26 May at ITC Maratha Hotel, Mumbai, India. The meeting was attended by delegates from several countries and two dozen presentations were made by speakers from industry and academia.

Dr. Ajit Kumar, Vice President, Product Development & Regulatory Affairs, United Phosphorus Limited, Mumbai, made the opening remarks about Agriculture production and pesticide consumption in India. India is 4th largest producer of agricultural chemicals behind USA, Japan and China with 125 technical units, 800 formulation units and a domestic market of \$900 million in a global market of \$30 bn. India exports pesticides worth \$700 million with 8% global share of generic market which stands at \$20 bn. Pesticide use is low in India (0.48 kg/ha) compared to Taiwan (17 kg/ha), Japan (10.7 kg) and USA (4.5 kg/ha) and there is greater scope for increased use. Pesticide use is highly skewed with >50% being in cotton and rice. Local pesticide companies helped Indian farmers by providing pesticides at 50 to 67% lower cost than Multi National Companies because of low manufacturing cost and a large pool of technical professionals, though they have inadequate financial capabilities and limited access to some of the latest technologies. UPL, with its several mergers and acquisitions in the USA, UK, Denmark, Spain, Argentina and South Africa is 11th in the world and is mastering the art of making quality products at lower prices. Due to financial upheavals, low commodity crop prices and reduced farm support, the growers will seriously seek cheaper crop protection options.



Ms. Sandra Shroff, Vice-Chairman UPL presented an assessment of opportunities to the Agriculture Industry. Food grain production in India increased from 99.5 mt to 233.88 mt from 1969-70 to 2008-09 from the same area (123 m ha). However, there is a large gap in technology dissemination in different parts of the country which needs to be bridged as we face the challenge of feeding 1.2 bn people. India has 10% of the world agricultural area, yet it consumes <3% of pesticides, whereas EU with 8% of the world Agricultural area consumes nearly 30% of world pesticides.

India is one of the most dynamic generic pesticide manufacturers in the world with >60 technical grade pesticides being manufactured by 125 producers consisting of large- and medium-scale enterprises (including about 10 multinational Companies) and more than 500 pesticide formulators all over the country. India will not only become export competent, but will also foster better policy initiatives on registration, patents and usage of agricultural products. This will enhance the credibility of this sector, attracting more investments. There will also be more adoption of modern processing technologies and cost-reducing measures of producing high quality crop seed.

Pradip Dave, CMD, AIMCO & President, PMFAI, Mumbai, India delivered a keynote address on examining domestic crop production trends and identifying new business opportunities for Indian agrichemical companies. India is the second largest producer (10%) of Fruits and Vegetables after China and horticulture crops account for 25% of agricultural exports. The pesticide market is growing fast in this sector. The herbicide market in India is \$290 million compared to \$800 million of insecticides in 2009, but the growth of herbicide use was 2.1% in 2008 compared to only 0.2% for

insecticides. India has the largest number of US FDA-approved plants and there is a huge untapped market in India and abroad for quality products.

Kailash Bhargava, Agro Consultant, Mumbai and Dr Arunkumar V Dhuri, Vice President – Registration & Business Development, Excel Crop Care Limited, Mumbai discussed the registration issue of pesticides. Paul Chambers, Plant Health Advisor, National Farmers Union UK elaborated the latest EU agrichemical regulations and the implications for the Indian crop protection export industry. Dr. S. Y. Pandey from Jai Research Foundation laid stress on data generation for registration requirement.

Dr. B. Saha, Senior Vice President, Nagarjuna Agrichem emphasized R&D, Discovery Research and greater Industry-Institute Partnership. India has advantage on labour cost, but the industry is fragmented, is dependent on imported raw material, and inconsistent in quality control. These have to be overcome. Infrastructure has to be improved and expanded to meet growing needs, automation of production has to be implemented, and cash flow R&D has to be increased. Binoy Shah, Director Sulphur Mills discussed the hurdles faced by Indian companies in exporting pesticides to the US and EU markets. The global pesticide market in 2009 was \$51.2 bn which is projected to grow by 8.9% to reach \$78.3 bn by 2014. Indian companies need to master practical strategies to navigate the regulations and deliver crop protection products to the US and EU markets.

Satish Sohoni, Business Head & Senior Vice President-Agrochemicals, HIKAL LTD., talked about Contract Research & manufacturing (CRAM) opportunities in the Indian agrochemical market. Bimal D. Shah, Director, Sulphur Mills and Dr. P. K. Patanjali discussed formulation technology. Dr Venkatesh Devanur, Secretary, Bio-Agri Inputs Producers Association delivered a presentation on BioPesticides - an emerging opportunity, which can reduce the overuse and misuse of harmful pesticides by integrating these bio-pesticides in the IPM programs. The Organic Food business is a \$40 bn industry and growing! Therefore demand for non toxic solutions for crop production and crop protection will increase.

Volker Spiesmacher, Global Marketing & Sales Director, BERICAP laid emphasis on developing

new technologies to improve the efficacy and safety of pesticide applications and meet tighter industry and regulatory requirements. Pesticide packaging plays a vital role in extending the shelf life, avoiding spillage (environmental issues) and improving efficacy.

Georgina Bingham from Rothamsted Research delivered a talk on novel techniques for overcoming insecticide resistance in crop pests. Dr. Shashi Bala Singh, IARI, New Delhi shared that no pesticide residues were reported in food grains or other plant products when recommendations were followed. Herbicides were safer compared to insecticides or fungicides, with minimum persistence and no detectable residues in the produce. Dr. Ketan Mehta, Director, Ecosense labs, Mumbai discussed Biotech Applications & GM Crop Production. GM crops should be bred not only for herbicide or insecticide tolerance but also for drought, salt and heat tolerance, nitrogen-fixing capability, and other traits to meet the future demands.

Samunder Singh, Weed Scientist and Secretary, Indian Society of Weed Science, presented the latest scenarios of herbicide resistance in India and management strategies. Herbicide resistance has been observed only in wheat. Paraquat resistance in tea gardens still needs verification. Herbicide resistance in *Phalaris minor* is very serious as it made isoproturon, diclofop-methyl and fenoxaprop-P-ethyl redundant and there is serious threat to clodinafop-propargyl, sulfosulfuron and also to pinoxaden. Isoproturon-resistant biotypes of *P. minor* were sensitive to fluazifop, quizalofop, tralkoxydim, sethoxydim, clethodim, trifluralin, pendimethalin, atrazine, propachlor, metazachlor and metribuzin, but not all of these herbicides are safe on wheat. Rotation of crops, herbicides, and agronomic practices can help minimize the menace of resistance. An IWM approach is needed to contain the threat of evolving multiple resistances in *P. minor* biotypes.

Samunder Singh



ISWS National Symposium on Integrated Weed Management in the Era of Climate Change



There were 160 participants from India and one from the UK in the Symposium held at NASC Complex, New Delhi on 21-22 Aug. 2010. The inaugural Session was chaired by Prof. R. B. Singh who had been at various important positions in ICAR, FAO and Chairman of Agricultural Scientists Recruitment Board. Dr. Singh, in his inaugural address, mentioned that the goal has been changed from self-sufficiency to sustainability and integrated weed management is the key to high yield as there is a wide gap between achievable yield and actual yield at the farmer's field. There has been no breakthrough in yield barriers in the recent past; the genetically modified crops have made some impact, but more need to be done to improve farm profitability and the farmer's economic health.



Climate change will have maximum negative impact on Indian Agriculture and we need to face the challenges head on. We should target carbon-neutral agriculture by 2050 to lower the impact of global warming and serious weed issues due to increased CO₂ concentration and higher temperatures. Weeds have greater resilience, whereas crops are more vulnerable to climate change and we need to work on mining genes for desirable traits from weedy species to eliminate

hunger and poverty. Resource Conservation technologies and IWM are synergistic.

Dr. I. P. Abrol, ex-DDG ICAR and Director CASA, in his key note address shared insight on sustainability and Conservation Agriculture (CA). A paradigm shift in Indian Agriculture is needed as reduced tillage is seen better than conventional tillage in conserving biodiversity. Soil cover by trees, crops, and plant residues helps in maintaining soil productivity. Higher residue retention will improve the organic carbon content of soil, conserve moisture, suppress weeds and will improve weed control efficiency of herbicides to some extent. This may lead to reduced need for herbicides and less problem for herbicide carryover to the rotational crop. Crop rotation in spatial and temporal dimensions is also an important factor in suppressing weeds, which can help mitigate the evolution of herbicide-resistant biotypes.

Dr. R. K. Gupta, South Asia Coordinator of CIMMYT and special keynote speaker mentioned the major impetus with the set up of CGIAR in Resource Conservation Technologies (RCTs). Terminal heat stress and effective weed management are the major issues of global warming and RCTs may help alleviate these problems. Identification of herbicide-resistant weed biotypes using classical assays and biotechnological tools are important in finding solutions to resistance problems. Regeneration of weed species (*Echinochloa* and *Phalaris* species) after herbicide application is a major threat to chemical weed management. Understanding the weed hardiness and their behaviour under altered climate will provide clues for effective management.

Dr. N. T. Yaduraju, President ISWS, in his welcome address presented the challenges and scope of IWM including HRCs. The overwhelming adoption of GM cotton by Indian farmers significantly lowered the insecticide load, but the long-term effect of HRCs on biodiversity and the environment is not yet fully understood. The integration of ITK (Indigenous Technical Knowledge) with improved agronomic practices is needed to maximize the utility of herbicides in controlling weeds. IWM has to be designed for each crop.

SESSION PROCEEDINGS – IMPACT POINTS

Session 1. Resource Conservation Technologies (RCT's)

- In direct seeded rice (DSR) weed flora is more complex with higher density than transplanted rice (TPR).
- Brown manuring (*Sesbania* killing with 2,4-D) is very important practice for DSR.
- Residue retention allows less weed emergence and growth and can be a long-term strategy for weed management in CA based agriculture.
- In rice based farming systems, rice + fish + poultry was found effective.
- Integration of *Coleus amboinicus* plant extract application followed by *Neochetina eichhorniae/bruchi* proved useful in biological control of *Eichhornia crassipes*.
- The DSR was found more successful in basmati rice compared to coarse rice.
- Though iron deficiency was more prevalent in DSR, no bakanae disease (foolish seedling disease) was observed.
- Long-term studies at CCSHAU showed that 12 years green manuring decreased the weed population in rice, but not in wheat. It increased the population of annual grasses in wheat, but decreased the population of broad leaf weeds.
- Weed flora simplification leads to increased demand of herbicides.
- Weed ecology must be understood for system approach in IWM.
- Higher seed rate of 120 kg/ha and broadleaf herbicide (2,4-D) under late sown zero till wheat was more remunerative under eastern Uttar Pradesh conditions.
- Tank mix of bispyribac with azimsulfuron (25+17.5 g/ha) was effective in controlling weeds under zero-till (ZT) direct seeded rice and obtained higher crop yields.

Session II & III. Herbicides as major part of IWM

- Due to inherent problems associated with herbicides viz. resistance evolution, weed flora shift, high cost and environmental pollution; there is greater need for green synthesis of a novel herbicide with unique structure and modes of action.
- A chalcone i.e. an aromatic 'Ketone' was found to exhibit herbicidal activity against mustard.

- Tank mix application of pendimethalin (0.75 kg/ha) and imazethapyr 0.10 kg/ha with 400 ppm GA₃ and 6% KNO₃ provided better control of *Cyperus rotundus* in soybean than their sequential application and resulted in higher crop yield
- Post emergence herbicides are highly desired in pulse crops particularly summer mungbean; application of imazethapyr 75 or 100 g/ha at 15 DAS provided effective weed control and higher yields; however, persistence is a major cause of concern for succeeding sensitive crops like mustard.
- No problem of herbicide residues in various harvested crops produce was found and is not a cause of concern under Indian conditions.
- Standardization of imazethapyr rates and timing is very important for the control of weeds in summer pulses in improving their yields and farmer's profitability.
- Judicious use of herbicides is required to increase their shelf life, avoid herbicide resistance evolution and optimum weed control.
- Avoid under dosing, spurious brands of herbicides, apply at proper time using recommended amount of herbicide, water volume and proper nozzle (flat fan), rotate herbicide, crops and integrate with other agronomic practices to have better efficacy of applied herbicides.
- Economic threshold values for dominant weeds infesting alone and in mix weed spectrum for different ecological zone should be established.
- In IWM the role of moisture (irrigation/rainfall) should be studied for different crops, soils and agronomic practices for different herbicides.
- Water hyacinth, the worst aquatic weed, worldwide can be used as an absorbent of heavy metals and toxic affluent from industrial and city waste, other than its use as mulch, organic material for vermicompost for an eco-friendly approach.
- Rate of pre-emergence herbicides can be lowered by 25% by integrating with one hoeing 30-40 DAS in several vegetables, pulses, medicinal and aromatic crops without compromising weed control efficacy.
- Irrigation at 1.0 ID/CPE ratio and PRE application of pendimethalin at 0.75 kg/ha followed by one weeding at 40 DAS was more effective in controlling weeds and

providing higher yields of fenugreek over other moisture levels and weed control treatments.

- Uncontrolled weeds caused >80% reduction in the yield of aerobic rice; pyrazosulfuron 30 g/ha provided yields similar to two hand weeding.
- *Trianthema portulacastrum* which poses severe competition with *Trifolium* (berseem) in the early stages of crop growth can be controlled by 1.0 kg/ha butachor or lower rates of pendimethalin (0.375 ml/ha). Mix cultivation of berseem with Chinese cabbage or raya (mustard) had greater smothering effect on *Trianthema* than berseem + ryegrass.

Session IV: Herbicide Resistance, HRCs and IWM

- Herbicide resistance is getting serious in wheat with cross- and multiple-resistance to several wheat herbicides.
- Several biotypes of *Phalaris minor* defied the field use of fenoxaprop, clodinafop and some concern is also being felt about efficacy of sulfosulfuron and even pinoxaden even before its field use in whole plant bioassay, pigment retention and ion efflux tests.
- *P. minor* has evolved multiple herbicide resistance against three modes of action of herbicides i.e. PS II, ACCase and ALS inhibitors.
- *P. minor* population resistance to clodinafop exhibited cross-resistance to fenoxaprop, tralkoxydim and pinoxaden. Similarly, sulfosulfuron resistant biotypes showed cross-resistance to mesosulfuron and pyroxsulam, but these populations were sensitive to triazines (metribuzin and terbutryn), dinitroanilines and also to glyphosate and paraquat.
- Chlorotoluron is also effective in controlling IPU-Resistant populations of *P. minor*.
- It was also highlighted that due to non-availability of new effective post-emergence herbicides against multiple resistant

populations, glyphosate or paraquat in combination with pendimethalin or terbutryn as pre-seeding options in zero-tillage (ZT) fields can be explored.

- However, for long term herbicide resistance management, strategies should have integration of chemical and non-chemical means like ZT, advanced sowing time, residue retention and crop rotation.
- Herbicide rotation and manual weeding helped in preventing evolution of herbicide resistance in rice weeds in India. Standing water in rice helps in controlling weeds and ultimately reducing the selection pressure. Since rice has more number of herbicides compared to wheat and chemical structure plays a significant role.
- Manipulation in planting time of wheat is vital in lowering the selection pressure of *P. minor* (early sowing) and *Avena ludoviciana* (late planting).
- Diagnostic facility for early detection of HR and making location specific recommendations could be another possibility for management of multiple resistance
- Integrated Management practices are already defined for management of multiple resistances in *P. minor*. The strategy needs to be implemented effectively.
- Herbicide resistant crops (HRC's) is an option to manage weeds effectively; however, relying solely on herbicides may not hold good in the long run as is being observed in glyphosate resistant crops and the rate of evolution of resistant biotype in US and other countries.
- Globally, HRC's constituted 63% of Genetically Modified Crops (GMC) area in 2009; this may further increase with stacking of genes of more than one herbicide tolerance in several crops.

SESSION V: Invasive weeds

- Plant quarantine is very important in the present context of globalization and free exchange of

plant and seed materials from overseas and within the country.

- The Directorate of Plant Quarantine and Storage regulates the entry of new crop/weed seeds in the country at several ports of entry.
- Emphasis is required on the knowledge sharing, exchange of data between the organizations and Indian Society of Weed Science should take a lead role in this regard in a collaborative manner.
- The regulatory mechanisms including different acts like Environment Protection Act (EPA) 1986, EPR 1989, Biological Diversity Act 2002, Wildlife Protection Act 1972, Plant Quarantine Order 2003 etc., for prevention and management of invasive alien species in India should be adhered in letter and spirit to ward off the ill effect of invasive alien weed species.
- Different approaches of management of invasive alien weeds like diagnostic manuals for weed seed identification, risk analysis, eradication and control is required on large scale to face the situation in the future.
- Plant Quarantine is relatively new to India and there is a need to properly identify and profile invasive and alien weeds already existing in India, so that there is a check from further inundating the country from these external threats to Indian Agriculture.
- Biological control in some weeds like *Fallopia japonica* and *Hydrocotyl ranuncularis* in Australia and UK was successful. Himalayan balsam (*Impatiens glandulifera*) is posing a threat in the UK and its control measures can be replicated on similar invasive weed species.
- In case of paddy, change from puddle transplanting to direct seeded rice is also a serious challenge for managing weeds and we can anticipate the problem of weedy rice.
- Scarcity of water/labour for transplanting and soil sicknesses are the major reasons for shifting from puddling to unpuddled DSR; the biology of upland weeds will help in managing weedy problem in DSR.

Session VI. Climate Change and Weed Biology

- Global warming not only raises atmospheric CO₂ concentration and temperature, but increased precipitation, drought, flood, abnormal weather are also associated with it which have a significant effect on agriculture.

- Climatic change and global warming is altering the floristic composition of weeds in various agro-ecosystems; perennial, invasive and sleeper (dormant invasive) weeds will pose greater threat.
- Climate change would impart more competitive advantages to weeds and favour invasiveness; both C3 and C4 plants will behave differently to higher concentration of CO₂ and temperature.
- Herbicide efficacy will be a major concern under higher temperature and CO₂ levels.
- Indian Agriculture will be impacted by 28% by global warming which is highest in the world.
- Reduced tillage or zero tillage in double cropped situation suppressed perennial weed with the help of non-selective pre sowing herbicides.
- Maize genotypes expressed better weed suppressing ability and could be considered as a tool in IWM.
- Differential competitiveness of some aerobic rice cultivars observed can be successfully exploited by integrating with lower rates of herbicides for effective weed management
- Cultural practices such as stale seed bed and green manuring are effective component of IWM
- Soil types need to be considered for standardizing herbicide dosages as they influence adsorption/desorption, leaching, persistence and metabolism of herbicides.

Samunder Singh,
Secretary, Indian Society of Weed Science

LEBANON

Arab Plant Protection Society

The 10th conference of the Arab Plant Protection Society was held in Beirut Lebanon Oct.26-30. It was attended by 700 members from 17 countries coming mostly from the Arab World. There were 620 papers presented during the conference in the various disciplines of plant protection including 20 papers in weed science.

The Society was established in Lebanon in 1981. About 2000 members from the Arab World and publish the Arab Journal of Plant Protection twice a

year as well as a newsletter. The next conference will be held in Cairo Egypt in 2012.

For information concerning the society, please contact Dr. Khaled Makkouk, P.O.Box 11-8281, Beirut, Lebanon. khaled.makkouk@cnrs.edu.lb

Dr. A. R. Saghir – Old Workhorse of Weed Science

Thank you for inviting me to contribute to the Sept. 2010 IWSS Newsletter. I am proud to be a chartered and life member of IWSS and was glad to attend the IWSS conference in 2000 in Brazil. My professional career of 35 years in teaching, research, extension, consultation and service in scientific societies were related to the field of weed management and agricultural development. In academia, I taught courses in Weed Science, mode of Action of Herbicides, Advanced Crop Physiology and Food Security both on the graduate and undergraduate levels.



My contributions in research centred originally on my PhD studies in relation to volatile compounds in *Allium*, their composition, distribution, biochemistry and goitrogenic effects. This garnered me the Asgrow Award in 1964 from the American Society for Horticultural Sciences.

In the early '70s, my research concentrated on the effect of herbicide on the yield and quality of several agronomic, vegetable and fruit crops. During this decade, I focused my attention also on studies related to the biology and control of the parasitic weed *Orobanche* which attacks the roots of solanaceous and leguminous crops. Control measures included the application of sub-lethal doses of glyphosate and the use of strigol analogues which stimulated the germination of *Orobanche* seeds prior to planting the host crops.

In the '80s, my research concentrated on finding solutions to another parasitic weed, *Cuscuta*, which twines around the foliage of legumes and several vegetable crops. Application of sub-lethal doses of glufosinate ammonium successfully controlled this

weed. In 1985, and as a result of many consultation trips to the Kingdom of Saudi Arabia, I published a "Weed Control Handbook for Saudi Arabia" co-authored with Dr. S.A. Chaudhary in both Arabic (pp. 141) and English (pp. 124), sponsored by the Ministry of Agriculture and Water of Saudi Arabia. In the '90s, in addition to my work on parasitic weeds, I studied the effect of soil solarization on weeds as an alternative to methyl bromide, which was used extensively in the United Arab Emirates. Successful results were obtained in lettuce, cabbage and cauliflower. Many of these findings were presented in regional and international weed control conferences in different parts of the world and were published in international journals.

My contributions to the field of weed management resulted also from my service in the professional societies. In 1968 I was elected a member of the New York Academy of Science. In 1985 I was awarded Honorary Membership to the Weed Science Society of America. In 1986 I was appointed as the first Editor-in chief-of the Arab Journal of Plant Protection. From 1989-1992, I served as President of the Arab Plant Protection Society. From 1993-96, my name appeared in the who's who in Lebanon. I am writing, and co-editing, a reference book on "Weed management in Arab Countries" to be published in 2012 during the 11th Arab Congress of Plant protection, which will be held in Cairo, Egypt.

I am glad to be also one of the founders of the Near East Weed Science Society (NEWSS) which includes members from Morocco in the west to Asian countries in the east, hoping that Indian colleagues may join. There is an agreement that NEWSS will organize their scientific meetings once every three years as part of the Arab Congress of plant protection meetings. The current President of NEWSS is Dr. Barakat Abu-Irmelieh, Professor of weed science at the University of Jordan, Amman, Jordan (barakat@ju.edu.jo). Dr.Khaled Makkouk is the current Editor of the Arab Journal of plant protection (Khaled.makkouk@cnrs.edu.lb)

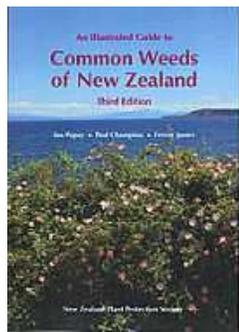
With best regards,
Abdur-Rahman Saghir
Consultant in Weed Management,
abedsaghir@yahoo.com

NEW Books Released

An Illustrated Guide to Common Weeds of New Zealand, 3rd Edition

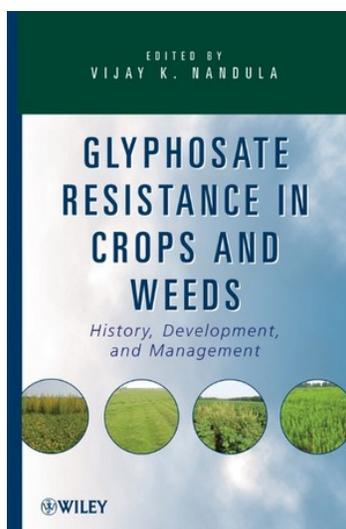
Ian Popay, Paul Champion,
Trevor James (2010)
ISBN 978-0-473-16285-6

RRP \$55.00. Order from
[Manaaki Whenua Press](#).



Glyphosate Resistance in Crops and Weeds: History, Development, and Management

Vijay K. Nandula
(Editor)
978-0-470-41031-8 •
Hardcover 344
pages • August 2010
• \$99.95



UPCOMING EVENTS

The **11th World Congress on Parasitic Plants** will be held from 7 to 12 June 2011 in Martina Franca, Italy



Parasitic plants - both the weedy species that severely constrain agriculture and the many other non-weedy species - present unanswered questions with regard to their origin and evolution relative to non-parasitic plants, population structures and dynamics, evolutionary pathways towards crop

parasitism, ecology, physiology, molecular biology, and the structure, function and development of their haustoria.

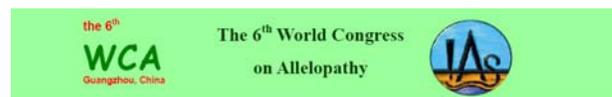
The Congress will include presentations at the cutting edge of parasitic plant research and management of parasitic weeds. A major emphasis will be the fostering of interaction among participants.

For any information please visit the official website of the Congress at the following address: <http://ipps2011.ba.cnr.it> or contact the local organizer, Maurizio Vurro, at maurizio.vurro@ispa.cnr.it or ipps2011@area.ba.cnr.it. The conference website is available here <http://ipps2011.ba.cnr.it/>, or can be accessed from the IPPS website (<http://www.parasiticplants.org/>).

Best regards,

Jim Westwood
President, International Parasitic Plant Society

6th World Congress on Allelopathy



The 6th World Congress on Allelopathy will be held in Guangzhou, China from December 15 to 19, 2011. The World Congress of Allelopathy (WCA) is a formal academic conference organized by the [International Allelopathy Society](#) every three years. Recent trends in sustainable development and advances in research methodology have helped to make allelopathy a rapidly growing research field throughout the world. The 6th WCA will provide an excellent opportunity for exchanges between those who are interested in allelopathy.

The city of Guangzhou is the southern gate of China with a subtropical climate. Because beautiful flowers can be grown year round in Guangzhou, it is called the “Flower City”. You are warmly welcomed by your hosts in Guangzhou!

Sculpture of Five Goats is the City Emblem of Guangzhou, China



For more information go to: The first circular is at <http://www.international-allelopathy-society.org/main/WCA/index.html>
<http://www.international-allelopathy-society.org/main/WCA/WCA.pdf>

Prasanta C. Bhowmik

IPMnet NEWS welcomes receiving information about global/local IPM and crop protection developments. Please forward to: IPMnet@science.oregonstate.edu information you believe would be of interest to the expanding global IPM community.

--cordially, A.E. Deutsch, editor/coordinator,
IPMnet NEWS
IPMnet@science.oregonstate.edu.

Other Major upcoming Events

2010

- Nov. 01-03, 2010 BCPC and UBM “CROPWORLD 2010” CONGRESS and EXHIBITION, at ExCeL London, UK. Info: M.A. Oakes, Michael.Oakes@ubm.com, Voice: 44-0-20-7921-8278, www.crop-world.com
- Nov. 01-05, 2010 8th International Workshop On Biological Control and Management of *Chromolaena odorata* and Other *Eupatorieae*; and 1st IOBC International Workshop on Management of *Parthenium hysterophorus*, Nairobi, KENYA. Info: C. Zachariades, ARC-PPRI, Private Bag X6006, Hilton, 3245, SOUTH AFRICA. Fax: 27-33-355-9423. ZachariadesC@arc.agric.za.
- Nov. 07-08, 2010 What Makes An Alien Invasive? Risk and Policy Responses, Edinburgh, UK. Info: <http://tinyurl.com/23swggr>
- Nov. 16-18, 2010 Canadian Weed Science Society Annual Conference, Regina, Sask., CANADA. Info: A. Drabek, PO 674, Pinawa, MB R0E 1L0, CANADA. Fax: 1-204-753-2363. assistant@cwss-scm.ca. Voice: 1-204-753-2915. www.weedscience.ca/home.
- Dec. 8-9, 2010 21st Columa Conference, International Meeting on Weed Control, Dijon, France, AFPP - 42 rue Raymond Jaclard 94140 ALFORTVILLE, France. Phone 33 (0)1 41 79 19 80, Fax 33 (0) 1 41 79 19 81, e-mail: afpp@afpp.net

2011

- Jan. 3-6, 2011 65th Annual Meeting of North Eastern Weed Science Society of America, Renaissance Harborplace Hotel, Baltimore, Maryland, www.newss.org
- Jan. 24-26, 2011 Southern Weed Science Society (U.S.) Annual Meeting, San Juan, Puerto Rico, USA. Info: SWSS, 205 W. Boutz, Bldg. 4, Ste. 5, Las Cruces, NM 88005, USA. swss@marathonag.com. Voice: 1-575-527-1888. www.swss.ws.
- Feb. 07-10, 2011 51st Weed Science Society of America Annual Meeting, Hilton Hotel, Portland, OR, USA. Info: K. Counter, KCounter@allenpress.com, www.wssa.net
- Feb. 09, 2011 Interaction of Pesticide Application and Formulation on Residues in Fruit and Vegetables, Jealott's Hill, Berkshire, UK. Info: <http://tinyurl.com/29frfp>
- Feb. 23-24, 2011 Crop Protection in Southern Britain 2011, Impington, Cambridge, UK. Info: R. Morgan, AAB, Warwick, Enterprise Park, Wellesbourne, Warwick CV35 9EF, UK. Rebecca@aab.org.uk Fax: 44-01-789-470234. Voice: 44-02-476-575195.
- Mar. 8-10, 2011 4th International Conference on Non-Chemical Crop Protection Methods, Lille, France. AFPP - 42 rue Raymond Jaclard – F- 94140 ALFORTVILLE, France. Phone 33 (0)1 41 79 19 80, Fax 33 (0) 1 41 79 19 81, e-mail: afpp@afpp.net, Internet www.afpp.net
- May 24, 2011 63RD International Symposium on Crop Protection, Ghent, BELGIUM. Info: G. Smagghe, iscp@ugent.be Fax: 32-09-264-6249. Voice: 32-09-264-6010. www.iscp.ugent.be/index.php
- June 07-12, 2011 11th World Congress on Parasitic Plants, Martina Franca, Inst. of Sciences of Food Production, Bari, ITALY. Info: M. Vurro, Maurizio.vurro@ispa.cnr.it or ipps2011@area.ba.cnr.it.
- Sept. 11-16, 2011 XIIIth International Symposium on Biological Control of Weeds, Kohala Coast of the Big Island, Hawaii, http://uhhconferencecenter.com/xiii_isbcw.html
- Sept. 12-16, 2011 3rd Symposium on Environmental Weeds & Invasive Plants (Intractable Weeds and Plant Invaders) in Ticino, Switzerland. Contact: Christian Bohren, ACW Changins, P.O.Box1012, CH-1260 Nyon, mobile +41 79 659 47 04, Switzerlandchristian.bohren@acw.admin.ch
- Oct. 2-7., 2011 The 3rd Symposium on Environmental Weeds & Invasive Plants (Intractable Weeds and Plant Invaders) Venue: Ticino, Switzerland in Ascona (monte verità) http://www.ewrs.org/doc/invasive_meeting_Ticino.pdf
- Oct. 10-14, 2011 Potential Invasive Pests Workshop, Miami, FL, USA. Info: H. Paszko, PO Box 110750, Univ. of Florida, Gainesville, FL 32611-0750, USA. HPaszko@ufl.edu Fax: 1-352-392-9734, Voice: 1-352-392-5930. www.conference.ifas.ufl.edu/TSTAR/
- Oct. 14, 2011 Connecticut Invasive Plant Working Group Symposium, Storrs, CT, USA. Info: www.hort.uconn.edu
- Oct. 18-22, 2011 North American Plant Protection Organization Annual Meeting, Kelowna, ALB., CANADA. Info: L. Cree, nappocanada@inspection.gc.ca Fax: 1-613-228-6602. Voice: 1-613-221-4546.

- Oct. 25-29, 2011 2nd Invasive Species in Natural Areas Conference, Coeur d'Alene, ID, USA. Info: conference@nripc.com, www.nripc.org/conferences.html
- Nov. 17, 2011 Advances in Biological Control, Marston, Lincs, UK. Info: R. Morgan, AAB, Warwick Enterprise Park, Wellesbourne, Warwick CV35 9EF, UK. Rebecca@aab.org.uk
Fax: 44-01-789-470234. Voice: 44-02-476-575195.
- Nov. 24-25, 2011 Integrated Pest Management in Europe, Endure, Paris, FRANCE.
Info: www.colloque.inra.fr
- Nov. 25, 2011 Innovative Ideas in Pest and Weed Control In Field Vegetables, Harpenden, Hertfordshire, UK. Info: R. Morgan, AAB, Warwick Enterprise Park, Wellesbourne, Warwick CV35 9EF, UK. Rebecca@aab.org.uk Fax: 44-01-789-470234. Voice: 44-02-476-575195.
- Dec. 13-14, 2011 Operator and Resident Exposure and Risk Assessment, Mainz, GERMANY. Info: S. Mummenbrauer, Die Akademie Fresenius GmbH, Alter Hellweg 46, 44379 Dortmund, GERMANY. SMummenbrauer@akademie-fresenius.de Fax: 49-231-758-9653. Voice: 49-231-758-9682.

2012

- Jan. 23-25, 2012 Southern Weed Science Society (U.S.) Annual Meeting, Charleston, SC, USA. Info: SWSS, 205 W. Boutz, Bldg. 4, Ste. 5, Las Cruces, NM 88005, USA. swss@marathonag.com, Voice: 1-575-527-1888. www.swss.sw
- March 27-29, 2012 The 7th International IPM Symposium, "IPM on the World Stage," Memphis, Tennessee USA, Memphis Cook Convention Center. Memphis Marriott Downtown, Tennessee. Margaret Appleby, margaret.appleby@ontario.ca, ipmsymposium@ad.uiuc.edu, website <http://www.ipmcenters.org/ipmsymposium12/>
- June 17-22, 2012 VI International Weed Science Congress, Dynamic Weeds, Diverse Solutions, Hangzhou, CHINA. Info: H.J. Huang, IPP, CAAS, No. 2 West Yuanmingyuan Rd., Beijing 100193, CHINA. iwsc2012local@wssc.org.cn Fax/voice: 86-10-628-15937. www.iwss.info/coming_events.asp

2013

- Feb. 18-22, 2013 International Herbicide Resistance Conference, Perth, Australia. Info: S. Powles, AHRI, School of Plant Biol., Univ. of Western Australia, 35 Stirling Hwy., Crawley, Perth 6009, WA, AUSTRALIA. Fax: 61-8-6488-7834. Voice: 61-8-6488-7870. Stephen.Powles@uwa.edu.au

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<http://www.iwss.info/newsletters.asp>

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to foster communication among and give
information to our members and others around
the globe interested in Weed Science.

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