Asian-Pacific Weed Science Society

NEWS LETTER

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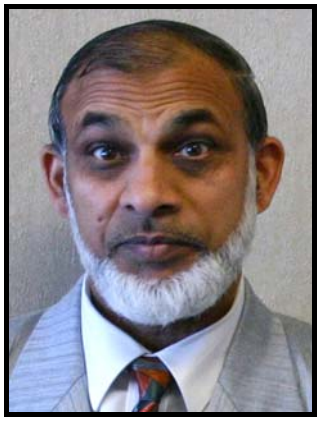
Anis Rahman wins award

Dr. Anis Rahman, who served as the Treasurer of APWSS for 14 years (1991-2005) has recently won the Best Paper award for a paper he co-authored for Weed Biology and Management, published in Japan.

The paper, titled- 'Correlation between the soil seed bank and weed populations in maize fields', is co-authored by Trevor K. James and Nik Grbavac. The Abstract of the paper is provided in this Newsletter under News from Japan.



Dr. Anis Rahman

Anis Rahman- a profile:

Anis Rahman is a renowned Weed Scientist, who is presently a Principal Researcher and Group Leader (Plant Protection) at AgResearch, Ruakura Research Centre, and also Manager of the Pesticides Research Unit, Ruakura Research Centre in New Zealand. Anis obtained his M.Sc. from University of Alberta, Canada (Plant Ecology) in 1968 and Ph.D. from University of Saskatchewan, Canada (Plant Science/Plant Physiology) in 1971. Anis has been recognized for his services to the field of science. A few highlights are given below:

- Queen's Service Order (QSO) for Public Services, 2003;
- Cited in 'Outstanding People of the 20th Century') 1st Edition, 1999 (p.461);
- Winner of 12th Khwarizmi International Research Award (2nd Place), Iran 1999;
- Cited in "Who's Who in the World' 15th Edition, 1998 (pp. 1147).

Contents of this Newsletter:

- AgResearch Grasslands Research Excellence Team Award, 1998.
- Best Research and Presentation Award (APWSS, 1985).

He also served as Vice President of the International Weed Science Society (2000 – 2004) and is a Honorary Fellow of the NZ Plant Protection Society (Elected in 2000), and a Past President of the same, which he now serves as Treasurer. He is also a Member of several national and international societies in the fields of Plant Protection, Horticulture and Soils. Anis serves as Associate Editor for one international journal, and as a Member of three other editorial committees and is a Technical Adviser to the NZ Pesticides Board and Noxious Plants Council.

Conference Report on Indian Society of Weed Science Biennial Conference, Hisar, 2-3 Nov. 2007

Dr. Samunder Singh from Hisar provided the following Report on a Biennial Conference of the Indian Weed Science Society, held at CCS Haryana Agricultural University, Hisar on 2-3 Nov. 2007.

Conference Summary Report

Several weed scientists from the Indian Society of Weed Science held a biennial conference on 'New and Emerging Issues in Weed Science' at CCS Haryana Agricultural University, Hisar on 2-3 Nov. 2007. More than 150 scientists participated in the two days deliberations, and this gathering included weed scientists from India, USA, Spain, Mexico and Brazil and Industry. Invited lectures were presented on theme areas other than poster papers.

The Chief Guest, Dr. J. B. Chowdhury, ex Vice-Chancellor of CCS HAU Hisar and GBPUA&T Pantnagar and Padamshree awardee, highlighted the importance of weed management in augmenting the possible yield potential of crops to feed the ever burgeoning population in Asia and world. A second green revolution is needed to match the food requirement of >1.1 billion Indian mouths.

In the **weed biology & ecology** session, Dr. N.T. Yaduraju from ICAR, New Delhi, presented a paper on invasive weeds and global agriculture. He emphasized that the vast majority of the noxious weeds in India are exotic, costing about US $117 billion. The country needs to formulate a sound strategy to manage these alien weeds. Dr. R.M. Kathiresan from Annamalai University (Tamil Nadu) spoke on weeds in relation to possible climate change. He emphasized that increasing greenhouse gases and global warming is expected to trigger suppression of native biodiversity by invasive alien weeds in India. Increased number of wet years between 1991 and 2000 compared to the preceding 10 years has resulted in the invasion of rice fields of Cauvery river delta in India by alien invasive weeds- *Leptochloa chinensis* and *Marsilea quadrifolia*, by virtue of their amphibious adaptation to alternating flooded and dry situations.

Dr. Samunder Singh from HAU, Hisar presented the paper on role of temperature and light on weed growth and herbicide efficiency. Several broad leaf weeds grown in the open (sun) and under greenhouse conditions had differential growth and response to applied herbicides. The efficacy of herbicides depended on the cumulative effect of temperature and light on the growth of the target weeds.

Dr. R. R. Bellinder from Cornell University, USA discussed the role of cover crops on weed management in vegetable crops. She emphasized that inter-seeded cover crops often suppress weeds compared with controls, but yield losses can occur due to direct competition between the cover crop and the main crop. She pointed out that as a rule of thumb, establishing the cover crop just before the vegetable crop has reached 50% of its vegetative growth will in most cases provide maximum weed suppression with minimum competitive impact on crop yields.

The following are highlights of the session on **direct seeded rice** (DSR):

- Dr. Ken Sayre, Director CIMMYT, Mexico warned about reduction in crop yields due to dwindling water resources and increased losses by weeds in DSR.
- Dr. U. S. Walia, from PAU Ludhiana, reported higher water use and degradation in soil physical properties in conventional puddle transplanted rice. He emphasized laser levelling as a pre-requisite for DSR. Early sowing before the onset of monsoon with a seed rate of 35 to 40 kg/ha, calibration of seed depth and the use of pretilachalor, PIH 2023 and azimsulfuron for were found encouraging for weed control in DSR.
- Dr. R. P. Singh from BHU, Varanasi emphasized on stale seed bed technique, suitable cultivars, high quality certified seeds and herbicide resistant varieties for DSR.
- Dr. R. K. Singh (BHU Varanasi) highlighted the emerging problem of weedy rice. He reported that DSR is more vulnerable to weedy rice and stale seed-bed technique is an option to control weedy rice. He stressed on use of biotechnological tools for the control of weedy rice, as herbicides are not available to control the diverse weed flora.

- Dr Samar Singh, CCS HAU Hisar, reported 2-3 fold increases in broadleaf weeds in DSR, whereas sedges remained the same. He suggested crop rotation, mulching, cover crop, sesbania intercropping, stale seed bed technique and frequent light irrigations and glyphosate followed by azimsulfuron with one hand weeding, to control weeds in DSR.

In the discussion session the outcomes were as follows:

1. Stale seed bed technique and laser levelling are the pre-requisite for DSR.
2. Seed rate for DSR should be 20-25 kg/ha
3. Ranking of available herbicides for weed control in DSR is as follows: PIH 2023, azimsulfuron, penoxsulam, fenoxaprop and bensulfuron
4. Grow basmati for better weed competition
5. Brown manuring can be a good option for weed control in DSR
6. Screening of suitable varieties is must for DSR
7. For effective weed control it was suggested to follow the herbicides at different stages as follows: Glyphosate (pre-seeding) Pendimethalin (pre-emergence), Azimsulfuron (10 DAS) Bispyribac (PIH) (25 DAS, Fenoxaprop with safener + Ethoxysulfuron mixture (40 DAS)

The following are highlights of the session on **GM Crops, Biotechnology and Herbicide resistance**:

- Dr. Krishna Reddy form Stoneville, USA discussed herbicide resistant crops and glyphosate resistant weeds. Adoption of HRC also resulted in the evolution of resistant weeds cornering the benefits of HRC. Stacked gene, weed diversity and the use of PRE and POST herbicides are the essential ingredients for future weed management.
- Dr. Ribas A Vidal discussed herbicide resistance in South America. Brazil has 17 resistant weeds, some with multiple resistances. Weed resistance to herbicides has spread to almost 20 states in Brazil infesting > 2 million ha resulting in losses over US $100 million. The resistance includes different target sites such as ACCase, ALS, EPSPS, Cell wall synthesis, quinclorac and protox inhibitors. Multiple resistance has been confirmed in *Euphorbia heterophylla*. He concluded by emphasizing that research and elucidation are not enough to avoid the evolution of herbicide resistance. Farmers and industry needs to play a greater role.
- Ribas Vidal and Rafael DePrado of Spain presented a third paper- on 'Struggling with herbicide resistance – one step beyond'. In USA, where Agriculture is most advanced, an exponential growth of resistant weed biotypes with cross- and multiple resistances to herbicides of several modes of action has been reported. Our knowledge about molecular biology, biochemistry, physiology and agronomy can help to solve the problem; however, farmers do not seem to believe this and they continue using traditional methods.
- Dr. Ram Murti Sirohi and Dr. Dheeraj Pant from Monsanto, India discussed importance of herbicide resistant crops in India. Contribution of agriculture to the country's economy is declining, average yields are low and weeds cause highest losses. Survey in the country indicated that herbicide use is limited to only a few states; in other states farmers tend to rely more on manual weeding. Biotechnology is a tool that needs to be adopted to increase output of food grains.

In the '**New Herbicides and Herbicide Resistance Management'** session scientists from industry (Dr. Rajul Edoliya from DuPont and Dr. Sunil Kumar, Bayer CropScience) and university (Dr. Anil Dixit from NRCWS, Jabalpur) highlighted the importance of new herbicides, which have low environmental risk (residues) and their judicious use to delay the evolution of resistance.

Dr. J. N. Majumdar from Syngenta and Dr. Ashok Yadav from CCS HAU Hisar discussed the problem of herbicide resistance in wheat weed (*Phalaris minor*); recent reported cases of clodinafop-propargyl and fenoxaprop-P-ethyl future and management strategies.

Dr. R. K. Malik from CCS HAU Hisar discussed non-chemical resistance management options. He said the resistance gets enhanced due to lower doses of herbicides, as it will select the ecotypes for mutation. He said that ecological considerations in weed management are important for resistance management. Tillage technology can reduce the problem of some weeds. He stressed that one myth that zero tillage is good for late sown conditions; this is even better under normal sowing of wheat to check the infestation of *Phalaris minor* and other weeds.

In the '**Weed Ecology, Biology and Global Warming'** session, Dr. A. K. Gogoi, New Delhi discussed global scenario of climate change due to global warming and its effect on floristic composition of weeds and their growth behaviour. The floristic composition of weed and their growth behaviour will change due to increased CO_2 concentration, temperature and acidity.

He further said that weeds and other pests are likely to be more aggressive due to elevated level of CO_2 and temperature. C_3 weeds are likely to be gain and may become more invasive due to global warming.

Dr. H. V. Nanjappa, UAS Bangalore emphasized the role of soil solarization in weed management. The use of transparent polyethylene sheets (0.05-0.1 mm thickness) was found most effective for this practice. Proper soil moisture content (> saturation) and duration of 30-45 days during summer months is essential for minimizing weed competition in vegetable nursery and succeeding crops.

Dr. Rajbir Sharma, IARI New Delhi, presented results of applying this technology for weed management in a cotton-wheat system. Incorporation of crop/plant residues along with polyethylene mulching decreased the weed infestation in cotton with favourable effect on wheat grown in sequence.

The Society recognized the following persons for outstanding contribution to weed science and the society:

- Dr. Rm Kathiresan (Annamalai Univ. Tamilnadu) and Dr. U. S. Walia (PAU Ludhiana, Punjab) with ISWS Gold Medals for 2006 and 2007, respectively;
- Dr. Samunder Singh (CCS HAU Hisar), H. V. Nanjappa (UAS Bangalore), Dr. Geeta Kulshrestha (IARI New Delhi) and Dr. A. K. Gogoi (ICAR, New Delhi) as ISWS Fellows for 2006; and
- Dr. Ashok Yadav (CCS HAU Hisar), Dr. J. S. Mishra (NRCWS Jabalpur) and Dr. A. S. Rao (Guntur, Andhra Pradesh) for ISWS Fellows for 2007.

Conference Report on Indian Society of Weed Science Biennial Conference, Patna, 25-26 February, 2008

The Indian Society for Weed Science held a biennial conference in Patna, during 27 and 28th February 2008 in Patna, Bihar.

The following is a Summary of the conference, provided by Dr. Prasad Babu from the National Research Centre for Weed Science, Jabalpur (**mbbprasadbabu@gmail.com**).

Conference Summary Report

Inaugural Ceremony

The Biennial Conference was ceremonially opened at the Bihar Veterinary College, Rajendra Agricultural University, Patna on 27th Feb, 2008. Shri. Ramadhar, Chairman, Farmers' Commission, Govt. of Bihar, Patna was the Chief Guest who inaugurated the Conference.

Dr. N.L. Maurya, Vice-Chancellor, Rajendra Agricultural University, Patna was the Guest of Honour.

Dr. Jay G. Varshney, President of the Indian Society of Weed Science, delivered the welcome address and Dr. Devendra Singh, Organizing Secretary of the Conference proposed the Vote of Thanks.

Conference Proceedings

The sessions of the Conference were held at the Auditorium of the Bihar Veterinary College, Patna, India during 27th - 28th Feb, 2008. There were three technical sessions and four concurrent poster sessions besides the Plenary Session.

About 150 delegates from all over India and two from outside the country (one each from USA and Australia) attended the Conference. A total of about 35 oral (including 12 invited) and 195 poster presentations were made. The Proceedings, including Abstracts of all papers presented, have been published.

Plenary Lectures

Three plenary lectures were presented. They were:

- Dr. Jay G. Varshney- 'Weed Management – Challenges and Opportunities',
- Dr. Nimal Chandrasena, Ecowise Environmental Pty Ltd, Sydney, Australia- 'Weeds and weed management under a changing climate'; and
- Professor Prasanta C. Bhowmik, University of Massachusetts, USA- 'Spread and management of quarantine and invasive weeds'.

Awards and fellowships

Two renowned weed scientists of the country were honoured with Life Time Achievement Awards in recognition of their significant contribution to the field of weed science. They were:

- Dr. S. Sankaran, Former Vice-Chancellor, Tamil Nadu Agricultural University, Coimbatore; and
- Dr. V. M. Bhan, Founder Director, National Research Centre for Weed Science, Jabalpur.

Photograph shows (from L-to-R) Dr. Sushil Kumar, Secretary of IWSC, Shri Rhamadhar, Chief Guest, Dr. N. L. Maurya, Vice Chancellor, Rajendra Agricultural University and Dr. J. G. Varshney, President of IWSC at the Inaugural Ceremony of the Conference

The following awards were also made:

ISWS Gold Medals- Dr. A.N. Tewari, Dean, College of Agriculture, CSA University of Agriculture & Technology, Kanpur

Dr. T.V. Ramchandra Prasad, Professor, Department of Agronomy, University of Agricultural Sciences, Bengaluru

ISWS Fellowships- Dr. R.K. Ghosh, Professor, Department of Agronomy, Bidhan Chandra Krishi Viswa Vidyalaya, Mohanpur

Dr. C. Chinnusamy, Professor, Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore

ISWS Honorary Fellow- Dr. (Mrs.) P.N. Ganga Visalakshi, Senior Scientist, Indian Institute of Horticultural Research, Bengaluru

ISWS Recognition Award- Dr. Sushilkumar, NRCWS, Jabalpur for his significant work on biological control of *Partheniu*

ISWS Best M.Sc. Thesis Award- Ms. V.S. Mynavathi, TNAU, Coimbatore for her work on "Evaluation of manually operated weeders in irrigated maize"

ISWS Best Ph.D. Thesis Award- Dr. Puja Ray, NRCWS, Jabalpur "Management of Water hyacinth employing some Insects and Fungi"

ISWS Best Book Awards- Dr. V.S.G.R. Naidu and Dr. Jay G. Varshney for their book in English titled 'Weed Seed Atlas'

Dr. Sushilkumar and Dr. Jay G. Varshney for their Book in Hindi titled '*Gajar Ghas ka Jaivikiya Niyantran: Vartman Sthithi and Sambhavanaien*'

General Body Meeting

The General Body Meeting of the ISWS was held in the evening of 27th Feb, 2008, which approved the new executive elected in the recently concluded elections, as mentioned below.

President	:	Dr. Jay G. Varshney, NRCWS, Jabalpur
Vice-President	:	Dr. A.N. Tewari, CSAUA&T, Kanpur
Secretary	:	Dr. Sushilkumar, NRCWS, Jabalpur
Joint Secretary	:	Dr. M.L. Kewat, JNKVV, Jabalpur
Treasurer	:	Dr. V.P. Singh, NRCWS, Jabalpur

In addition, the General Body elected two Zonal Secretaries each from the five Zones; they are:

- North- Dr. Jai Dev Sharma & Dr. S.S.L. Tripathi,
- South- Dr. G. N. Dhanpal & Dr. C. Chinnusamy,
- East- Dr. R. K. Ghosh & Dr. Devendra Singh,
- West- Dr. R.B. Patel and
- Central- Dr. Anil Dixit & Dr. S.S. Kolhe

Scientist-Extension Worker-Farmer Interface

A Scientist-Extension Worker-Farmer Interface was held on 28th Feb, 2008 which was chaired by Dr. Jay G. Varshney, President, ISWS. During the interface, solutions were offered to several problems on weed management being faced by the farming community of Bihar state.

Plenary Session

After two days of successful deliberations, the Conference concluded with the Plenary Session on 28th Feb, 2008, which was chaired by Dr. S. Sankaran, Former Vice-Chancellor, TNAU, Coimbatore.

Full Conference Report

The full Conference report is also available from Dr. Sushil Kumar (**dr.sushilkumar@rediffmail.com**) or from Dr. Prasad Babu (**mbbprasadbabu@gmail.com**).

Invitation to attend 16th Australian Weeds Conference, 18-22 May 2008

Dr. Michael Widderick, Chairman of the Organizing Committee of the 16th Australian Weeds Conference, has sent the following invitation to the weed science community.

Don't miss the 16th Australian Weeds Conference

On behalf of the organising committee of the 16th Australian Weeds Conference, I cordially invite you to attend this biennial conference to be held in Cairns, Australia, 18-22 May 2008. Registrations for this premier event are open now. The conference is being hosted by the Weed Society of Queensland on behalf of the Council of Australasian Weed Societies and has the theme of 'Weed Management 2008 – hot topics in the tropics'. The conference will showcase recent advances in weed science, extension and policy across Australian and international communities and landscapes.

The conference will include 4 keynotes, 126 oral and 86 poster presentations. In addition, there is a symposium on 'Threats to biodiversity' and four issue forums on: 'The role of genetic modified crops in Australia'; 'Defeating the Weed Menace - achievements and future'; 'Weeds in the media'; and 'Towards national legislation'. There will also be trade exhibitors and many opportunities to network with others in the weed community. The conference will appeal to anyone involved in weed R & D, management and extension.

Cairns is the international gateway to tropical North Queensland, and carries with pride the mantle of safest tropical city in the world. Residents of the area are proud custodians of two of the world's greatest natural treasures - the Great Barrier Reef and the Wet Tropics Rainforests. Both of these wonderful attractions are World Heritage listed, and there are very few places on earth where two such treasures rest side by side. On the Wednesday of the conference there is opportunity to see some of the local attractions during 1 of the 5 field trips available.

The field trips will be followed by the conference dinner, which will take on a tropical theme. Cairns is rated the third most popular tourist destination in Australia and the city is a vital, cosmopolitan centre with its residents enjoy an enviable tropical lifestyle.

If you require any further information about the conference, please do not hesitate to contact our conference secretariat on +61 7 3334 4460 or email **16awc@eventcorp.com.au** .

For further information on the 16th Australian Weeds Conference, including registration, please visit our website **www.16awc.com.au**.

We look forward to seeing you in Cairns in May 2008.

Dr Michael Sidekick

Conference Chair

5th World Congress on Allelopathy announced

The International Allelopathy Society will hold its triennial congress on 21-25 Sep, 2008 in Saratoga Springs, New York. This meeting will bring together an international community that works on all aspects of allelopathy.

There will be sessions on all aspects of allelopathy, including Allelopathic interactions with microbes, fate of allelochemicals in soil, allelochemical identification, allelopathy in forest ecosystems, allelopathy in agricultural settings, physiology and biochemistry of allelopathy, invasion ecology and allelopathy, allelopathy methodologies, and allelopathy in aquatic ecosystems. Abstracts were due on April 1, 2008.

For further information, go to **www.iascongress5.org**. If you have any questions, please contact Steve Duke (**suke@olemiss.edu**) or Prasanta Bhowmik (**pbhowmik@pssci.umass.edu**).

News about Key Events

Consultation on Herbicide Tolerant GM Crops Organized in India

A "Consultation on Herbicide Tolerant GM Crops" was held in New Delhi on 10-11 December 2007 with an objective to discuss the relevance and need of herbicide tolerant (HT) crops in India.

It was jointly organized by National Research Centre for Weed Science, Jabalpur and Biotech Consortium India Limited (BCIL) and was attended by more than 60 participants including scientists from research institutions, agriculture universities, industry, policy makers and farmers.

Photograph shows Dr. Man gala Ray (centre), Dr. J. G.Varshney (R) at the commencement of the event

Dr. Man gala Rai, Secretary, Department of Agricultural Research and Education (DARE) and Director General, Indian Council of Agricultural Research (ICAR), New Delhi, in his address stressed that new technology like transgenic crops are the need of the hour to meet the challenges in Indian agriculture.

Dr. Jay G. Varshney, Director, National Research Centre for Weed Science, Jabalpur, expressed the view that NRCWS could play a lead role in collaboration with both public and private sector in evaluating the impact of HT crops.

Various experts made presentations on different aspects of HT-GM crops, their global status, impact, safety concerns, bio-safety assessment procedures and socio-economic considerations.

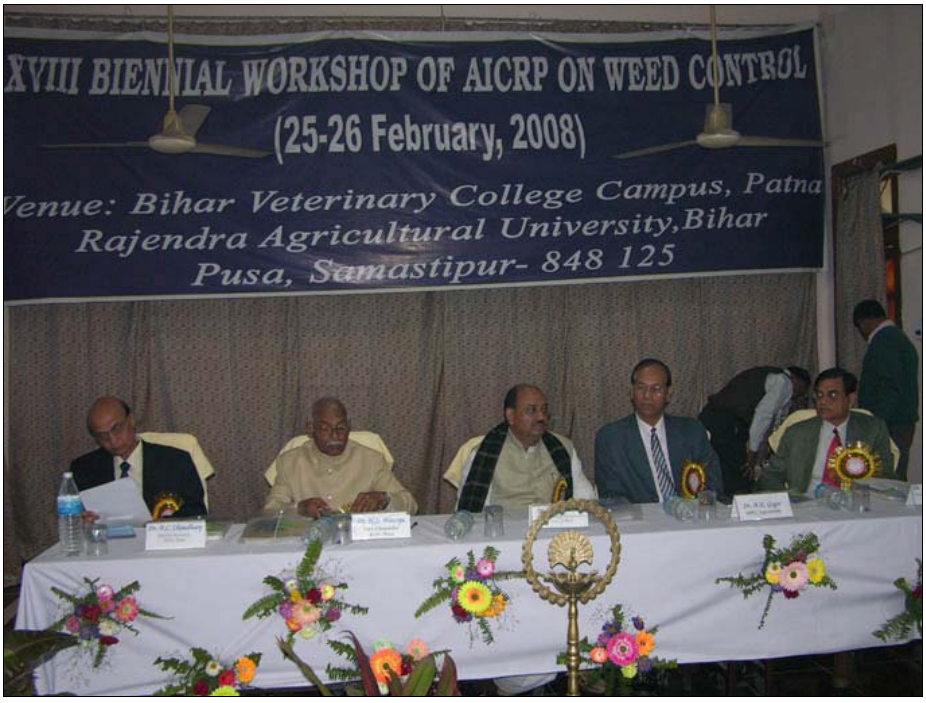
Dr. A. K. Singh, Deputy Director General, ICAR; Dr C.D. Mayer, Co-Chairman, Genetic Engineering Approval Committee (GEAC) and Chairman, Agricultural Scientists Recruitment Board, ICAR, New Delhi and Dr K. K. Tripathi, Member Secretary, Review Committee on Genetic Manipulation (RCGM) and Dr. P. L. Gautama, Deputy Director General (Crop Science), ICAR, also took part in the consultation.

The deliberations during the consultation brought out the following recommendations:

1. There was a general agreement that HT crops would offer simplified and efficient control of weeds. The need of HT crops was particularly felt in wheat, rice, maize, cotton and pulses in the country.
2. Efforts should be made towards evaluation and development of herbicide tolerant technologies in Indian conditions.
3. Appropriate models for viable public private partnership (PPP) are developed, in order to leverage the strength of each other for the evaluation of such technologies. An interface can be created to work out the modalities of such collaboration specific to various crops.
4. The collaborative research through public private partnership should be expedited in order to bring products in the country, in addition to the initiatives by the private sector.
5. The bio safety aspects such as health and environmental safety concerns of HT crops should be properly addressed by following established science-based national and internationally accepted regulations and guidelines.
6. It was agreed that efforts should be made to evolve/chalk out integrated weed management strategies involving herbicide tolerant GM crops for different situations. NRCWS while coordinating with other Saes and non-government organizations will play the pivotal/nodal role in this endeavour.
7. Suitable environmental safety assessment should be carried out as part of pre-commercialization studies, to address various concerns such as the development of 'super weeds' due to the introduction of HT crops in the country.
8. Regarding socio-economic concerns, it was agreed that labor availability has become a major issue in addition to the high labor cost. This becomes more pertinent for weeding operations during critical time of weed control. Therefore, the need for HT crops has become more relevant in the present context.
9. There is an urgent need to create public awareness about HT crops among various stakeholders and therefore concerted efforts by agricultural societies, research institutions, industry and their associations, NGOs and media should be initiated particularly for providing science based information to allay the apprehensions.

Additional information on the event can be obtained from Dr. Prasad Babu (mbbprasadbabu@gmail.com).

All India Coordinated Research Project on Weed Control (AICRP-WC)- XVIII Biennial Workshop



Photograph showing the opening ceremony. Dr. N. L. Maurya is second from left and Hon. Minister is third from left

The Biennial Workshop of AICRP-WC was held at the auditorium of the Bihar Veterinary College, Rajendra Agricultural University (RAU), and Patna on 25-26 February, 2008.

About 100 scientists working on weed management in the 22 cooperating centres of the project from across India attended the Workshop. Shri Narendra Singh, Hon. Minister of Agriculture of Bihar, ceremonially inaugurated the event.

Dr. N. L. Maurya, Vice-Chancellor, RAU, Dr. A. K. Gogoi, ADG (Agro), NRM, ICAR, New Delhi and Dr. B. C. Choudhary, Director of Research, RAU, Patna also graced the ceremony.

Dr. J. G. Varshney, Director, NRCWS, Jabalpur and the National Co-ordinator of the AICRP-WC, delivered the welcome address and also presented the research achievements under the project during 2007.

Photograph showing the release of the book 'Methods in Weed Science' authored by Dr. Abraham

There were four technical sessions, one each on major findings of network trials, research highlights of station trials, formulation of the network technical programme for 2008-09 & 2009-10 and interactions with herbicide industry.

The salient findings of the network, as well as station trials for the past two years were presented, thoroughly discussed and reviewed.

The technical programme to be taken up for the coming two years (2008-09 and 2009-10) was finalized after extensive discussions.

The following awards were also given during the workshop.

- AICRP-WC Best Annual Report: Anand Agricultural University, Anand, Gujarat
- AICRP-WC Best Centre: Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu

The following publications were released during the inaugural ceremony.

- Methods in Weed Science authored by Dr. C. T. Abraham, Kerala Agricultural University, Thrissur.
- Research Techniques in Weed Science authored by C. Chinnusamy, Tamil Nadu Agricultural University, Coimbatore.

News from Members and Countries

News from Australia

Precept® - a new broadleaf herbicide for the cereal industry in Australia

In Australia, Bayer CropScience has recently registered Precept® (25g/L pyrasulfotole + 125g/L MCPA + 6.25g/L mefenpyr-diethyl) for the control of wild radish (*Raphanus raphanistrum*) and other annual broadleaf weeds in cereals. Wild radish is a major weed in Australia with existing resistance to acetolactate synthase (ALS)-inhibiting herbicides, photosystem II-inhibiting herbicides, auxin analogue herbicides and phytoene desaturase (PDS)-inhibiting herbicides.

Pyrasulfotole acts on the 4-hydroxyphenyl-pyruvate dioxygenase (HPPD) enzyme which affects photosynthesis, vitamin production and carotenoid production. The PDS-inhibiting herbicides also affect carotenoid biosynthesis but with a different mode of action.

Precept®, containing pyrasulfotole, is the first HPPD product registered in Australia for the control of broadleaf weeds in cereals. Field and glasshouse studies have confirmed Precept® to be a useful tool for growers managing wild radish because it controls PDS-resistant, ALS-resistant as well as susceptible wild radish.

Its ability to control PDS-resistant and ALS-resistant wild radish is significant because many Western Australian wild radish populations have been confirmed resistant or developing resistance to the PDS-inhibiting herbicides diflufenican and picolinafen and the ALS-inhibiting herbicides chlorsulfuron and triasulfuron.

Further information from Dr Aik Cheam (acheam@agric.wa.gov.au**) or Mike Clarke (Mike.Clarke@bayercropscience.com)**

Can reduced rates of herbicide lead to resistance?

The answer is yes and data are now available in support of this. In the 90s, the concept of creeping resistance was expounded by Jonathan Gressel to explain the rapid development of herbicide resistance in annual ryegrass (*Lolium rigidum*) observed in Australia where reduced doses are commonly used. Unfortunately, at that time no experimental data were available but since then, three major studies have shown that herbicide selection imposed at low rates can result in resistance.

The first study was reported at the Third International Weed Science Congress in Brazil in 2000 based on research carried out at the University of Buenos Aires. It was reported that diclofop-methyl sub-lethal doses could increase *Lolium multiflorum* tolerance.

More recently, research with *Lolium rigidum* by the Western Australian Herbicide Resistance Initiative in Western Australia, confirmed that sub-lethal doses of diclofop-methyl and glyphosate could cause a shift towards resistance. However, resistance evolution to low rates of glyphosate appears to be slower.

In the field, factors that can contribute to weeds receiving a sub-lethal dose include using the active ingredient lower than the label rate and inadequate coverage from treatments. The latter could arise from a number of factors, which include the following:

- Variable-sized plants with over-lapping leaves at spraying,
- Dense crops and presence of other weeds,
- Spray pattern irregularities,
- Herbicide drift,
- Herbicide antagonism, particularly in tank mixtures with other herbicides,
- Poor water quality,
- Partial control of non-target species, and
- Environmental factors, such as low soil moisture or frosts, which could reduce herbicide uptake or translocation.

As the price of herbicide is increasing, the temptation to cut rate is high but one must be aware of the adverse impact of rate cutting.

Further information from Dr Aik Cheam (**acheam@agric.wa.gov.au**).

Summary of Thesis

The following is the Summary of a Ph.D. thesis being submitted by Gary Dorr at University of Queensland.

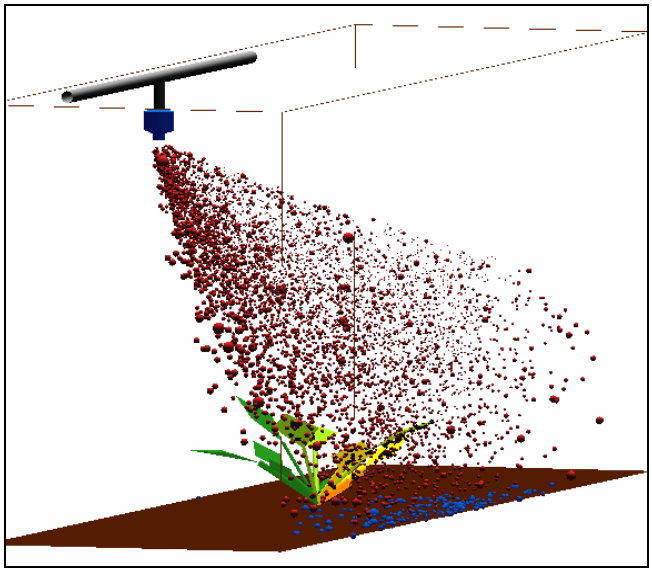
Minimising environmental and public health risk of pesticide application through understanding the droplet-canopy interface

Gary Dorr (g.dorr@uq.edu.au)
University of Queensland. Australia

Accurate placement of pesticide droplets on to weed surfaces is a key step in controlling weeds in agricultural production systems. Coverage of pesticides on plant surfaces is complex and is determined by a multitude of interactions between factors such as size and density of spray droplets, relative humidity and turbulence of the air through which the droplets travel, and the physical characteristics of the target plant leaves, branches and stems that go to make up the architecture of their canopy. There are, however, concerns over the effect of pesticides on the environment and public health.

This project combined three dimensional (3-D) computer modelling techniques, physical measurements of droplet movement and impact on a canopy in a wind tunnel and risk management techniques to maximise the effectiveness of pesticides and enable risks to public health and the environment from agricultural spraying activities to be minimised.

L-studio, a Windows based software environment for creating simulation models of plant architecture (University of Calgary, http://algorithmicbotany.org/) was used in this study. A particle trajectory model based on a combined ballistic and random walk approach was used to model spray droplet movement from spray nozzles.



L-Studio simulation of a sow thistle plant being sprayed in the wind tunnel

Algorithms were included in the spray model to account for droplet evaporation, entrained air and movement of air around the spray, collection efficiency, and droplet splash. Functional-structural plant models of cotton (*Gossypium hirsutum* L.) and sow thistle (*Sonchus oleraceus* L.) and a static empirical model of immature grass weeds were combined with the spray model and an external program was used to take the location of the leaves in 3-D space from the plant model and determine if spray droplets will impact on any of them.

Wind tunnel measurements were made to determine initial droplet properties (droplet size, droplet velocity, trajectory, density and fluid properties) and droplet impact characteristics (retention and splash).

The results from these measurements were then used to define parameters within the spray model. Additional experiments to measure spray drift and spray deposition on various plant surfaces within the wind tunnel were used to evaluate the combined spray and plant architecture model. The model output showed that spray deposition densities (µg cm^{-2}) on cotton and sow thistle leaves were the same when plants were sprayed by either air induction nozzles (VMD = 462 µm) or extended range flat fan nozzles (VMD = 202 µm).

However, the extended range nozzles produced a higher deposit on wild oats at both the 5-leaf and 2-leaf growth stages than air induction nozzles. Measured deposit densities showed these same trends. This difference in deposition from the two nozzle types is probably due to collection efficiency differences for the small, narrow leaves in a more vertical orientation with the wild oat plants compared to the broadleaf plants (cotton and sow thistle). The higher deposition on wild oat plants sprayed with the extended range nozzle was reflected in lower spikelet numbers from 5-leaf wild oat plants sprayed with glyphosate.

This work has shown that 3-D plant architecture can influence the amount of spray depositing on leaf surfaces. Deposition on plant surface was found to increase with decreased wind speed and reduced release height of the spray. Spray drift was found to increase with decreasing droplet size, increasing the range of droplet sizes emitted by a nozzle, decreasing droplet velocity, increasing wind speed, increasing delta T (decreasing relative humidity), decreasing liquid density and increasing release height.

News from China

Minimum Lethal Dose Herbicide Technology Project Summary

Hongjun Zhang from the Institute for Control of Agrochemicals, Ministry of Agriculture in Beijing provided the following report, which is a Summary of a Sino-Dutch project on sustainable weed control.

Introduction of Dutch MLHD-technology in China's agriculture

Intermediate summary Sino-Dutch project on sustainable weed control

Report prepared by:

Corne. Kempenaar (Plant Research International B. V., Wageningen, Netherlands, 6708) & Hongjun Zhang (Institute for Control of Agrochemicals, Ministry of Agriculture, Beijing 100026)

Hongjun Zhang

Introduction

One of the environmental policies of the Chinese government is reduction of use and adverse side-effects of pesticides. From 2004 to 2008, several organizations from China and the Netherlands cooperate in the CMHD-project to explore the introduction of Minimum Lethal Herbicide Dose (MLHD) system in China, so as to reduce herbicide use in important arable crops, starting with summer maize, spring soybean and winter wheat.

Over the last twenty years, herbicide weed control is shifting from application of soil herbicides towards reduced dosages of contact herbicide (so called low dosage systems). The MLHD system makes choices in low dosage systems more rational.

MLHD provides information on minimum effective dosages for contact herbicides in look-up tables, and uses sensor technology (PPM meter) to predict effects of these herbicides on weeds and crop shortly after application. The predictions are then used in next crop and weed management decisions. Under Dutch conditions, MLHD has shown an average reduction of herbicide use of 30 % compared to standard practice while maintaining good levels of weed control and crop yield.

The organizations that cooperate in the CMHD-project are ICAMA and provincial ICA from China, and DLV Plant, EARS, HOFUNG and Plant Research International of Wageningen UR from the Netherlands.

The project is focused on training of key Chinese weed control experts in MLHD, demonstration and evaluation of the MLHD system in three arable crops in four Chinese provinces (Heilongjiang, Shandong, Hebei and Beijing) in China, and diffusion of the technology to selected provincial extension technicians.

Results

MLHD in Maize

Results obtained in summer maize are most suited for evaluation of the perspective of MLHD in China. Key parameters on herbicide use, number and times of herbicide applications, efficacy and yield have been calculated from the data collected in trial and demonstration fields. The overall results are presented in Table 1 for current Chinese normal practice (lance spraying of soil herbicides) and for MLHD, either sprayed with constant pressure lance or spraying boom.

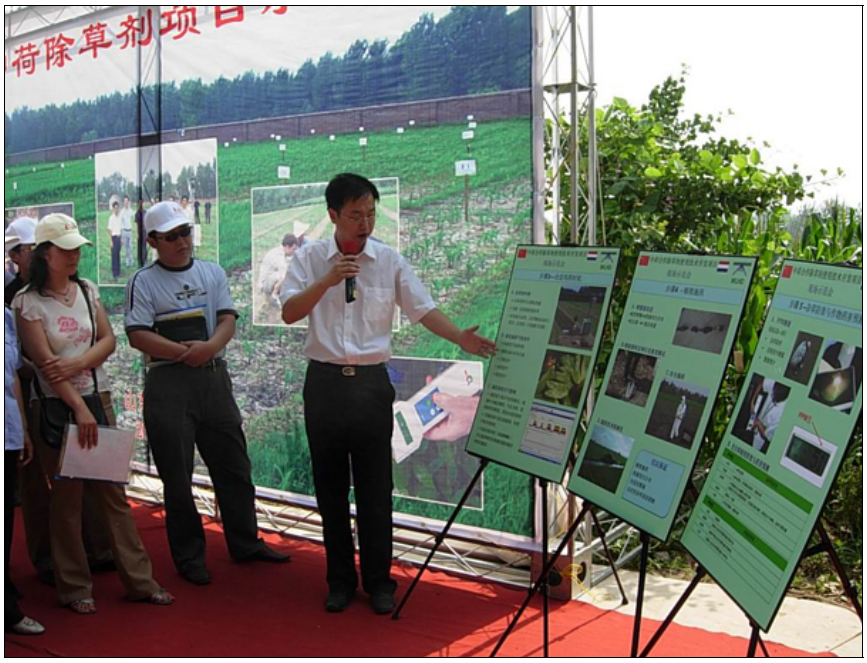
Table 1 showed that a shift from applying soil herbicides (Normal Practice) to dosing of contact herbicides according to the MLHD system reduced herbicide use in maize by circa 50 %. Moreover we see increased efficacy of weed control and higher crop yields. The reduction in environmental effects by MLHD is even larger than 50 % because of a use of herbicides which are less harmful to ground and surface water. The costs of herbicides used in MLHD are slightly higher then in Normal practice.

MLHD in Soybean

Results obtained in spring soybean are comparable with those in summer maize. The data set, however, is still too small to draw comprehensive conclusions. MLHD in spring soybean requires at 2 times for post-emergence herbicide sprays in combination with mechanical or manual weed control to obtain a good level of control. The reduction in environmental effects by MLHD is also larger than 50 % because of a use of herbicides which are less harmful to ground and surface water. The costs of herbicides used in MLHD are comparable to Normal practice.

Table 1. Summary of results of 2 field experiments and 20 demonstration fields applying MLHD in maize in 2006 (data 2007 will be added when available)

Parameters	MLHD boom	MLHD lance	Normal practice
Herbicide use (gram active ingredient per ha)	515	587	1140
Times of herbicides sprays per crop	1	1	1
Efficacy	90%	81%	75%
Crop yield (normal practice = 100 % and untreated = 81%)	108	103	100



Photograph showing demonstrations in Hebei

MLHD in winter wheat

Results obtained in winter wheat concerning efficacy are comparable with those in summer maize and spring soybean. The data set is however still too small to draw conclusions from.

MLHD in winter wheat requires one post-emergence herbicide spray. However, there still is discussion about the optimal timing of the spraying, whether it should be in autumn or in spring. When weeds have grown too big in spring, the photosynthetic inhibitors used are usually not very effective.

More results on Winter Wheat will follow after the demo-fields in 2008; two of these fields have been sprayed in autumn 2007. The reduction in environmental effects by MLHD appears to be low, and is also dependent strongly on the herbicides used (2, 4-D or tribenuron-methyl). The costs of herbicides used in MLHD are comparable to Normal practice.

Prediction of herbicide efficacy of weed control with PPM

The Plant Photosynthesis Meter (PPM) was successfully used to demonstrate the effect of photosynthesis inhibiting herbicides on weeds. Measurements predicted the efficacy well, provided at least 10 measurements per species are done. Key Chinese weed control experts have mastered the use of the instrument.

Prediction of crop yield with PPM

A clear relation between PPM-measurements of the crop and crop yield was not obtained in the project. This may be due to antagonism between effects of herbicide and weed competition on crop growth.

Photograph showing demonstrations in hei longjiang province

Spray technology

The MLHD system assumes good spray technology. Much attention was given in the project to demonstration of good practice for lance sprayers.

Results show that the MLHD dosages do not need adaptation for the Chinese situation.

Table 1 shows a trend of better efficacy when the boom sprayer is used, although spraying on top of summer maize and spring soybean plants may cause some temporary damage to the crop.

Photograph showing demonstrations in Shandong

GEWIS

GEWIS is a Dutch Decision Support System for optimal timing of application of pesticides. It was installed with local weather stations on the trial fields for the adjustment of MLHD dosages for adverse weather situations.

A reliable weather forecast is crucial for the optimal use of GEWIS, and is a point of attention for its implementation in China. GEWIS may further enhance the application of MLHD (and low dosage systems in general), although even without such technology very good results have been achieved.

Training

Chinese weed experts of ICAMA and provincial ICA were trained in all aspects of the MLHD. After a 'train the trainer' program, the ICA experts trained the local teams of extension technicians that were responsible for the demonstration fields in the Provinces. Altogether a significant number of extension officers (over 100) are now capable to carry out the MLHD system in local field.

Extension

In 2007 the first dissemination activities were organized. Three successful information days were held on demonstration fields in Heilongjiang (spring soybean), Shandong and Hebei (both summer maize).

Over one hundred people, high ranking officials, policy makers as well as extension technicians were informed about all aspects of MLHD. The MLHD manual, the PPM-meter, plots sprayed with reduced dosages and demonstration of improved lance sprayers played a key role in the communication of MLHD to extension technicians.

Photograph showing demonstrations of lance sprayer

Conclusions

The overall results show that the MLHD system has a high potential to reduce herbicide use and their potential adverse environmental effects, and in this way make Chinese agriculture more sustainable.

MLHD can help Chinese agriculture to make the important step from application of mainly persistent soil herbicides to use of optimized dosages of contact herbicides.

A reduction of 50 % in herbicide use was demonstrated in maize.

Conclusions for the other two crops will be available in 2008.

Photograph of Hongjun Zhang testing a spray unit

Despite differences in the agricultural systems between China and the Netherlands, there seemed to be little need for large changes in the MLHD system when the system is introduced in China on a large scale.

The MLHD dosage recommendations proved to be effective provided good spray technology is employed (i.e. adapted lance sprayer with constant pressure valve) and spraying is conducted when weather conditions are most favorable to herbicide application. The Plant Photosynthesis Meter (PPM) was useful to predict herbicide efficacy of photosynthesis inhibiting herbicides and is seen as a useful tool in the promotion of optimization of herbicide dosages.

The use of MLHD showed significant increased crop yields in maize (about 5%). MLHD is ready for introduction in maize in China.

Additional information on the Project can be obtained from Hongjun Zhang (hongjun-zh1975@163.com).

News from Japan

Dr. Jun Ushiki (jushiki@affrc.go.jp) from the IWM Research Team, National Agricultural Research Center in Tsukuba provided the following information. Dr. Jun's address is: 3-1-1 Kan-nondai, Tsukuba, Ibaraki, 305-8666 JAPAN; Tel & Fax +81-29-838-8953

The Weed Science Society of Japan confers the Best Paper Award of the *Weed Biology and Management* and *Journal of Weed Science and Technology* on the following authors of excellent papers published in both Journals in 2006 on the recommendation of the Editorial Board of the *Weed Biology and Management* and *Journal of Weed Science and Technology*.

The Best Paper Award of *Weed Biology and Management*

Correlation between the soil seed bank and weed populations in maize fields

Anis Rahman, Trevor K. James and Nik Grbavac

Abstract

Annual weed populations establish every year from persistent seed banks in the soil. This 3 year study investigated the relationship between the number of weed seeds in the soil seed bank and the resultant populations of major broadleaf and grass weeds in 30 maize fields. After planting the crop, 1 m^2 areas were protected from the pre-emergence herbicide application. Soil samples were collected soon after spraying to a depth of 100 mm and the weed seeds therein were enumerated. The emerged weed seedlings in the field sampling areas were counted over the following 8 weeks. Up to 67 broadleaf species and five grass weeds were identified, although not all were found at every site and some were specific to a region or soil type. For the most abundant weeds in the field plots, on average 2.1–8.2% of the seeds of the broadleaf species and 6.2–11.9% of the seeds of the grass weeds in the soil seed bank emerged in any one year, depending on the species.

Overall, the results showed a strong linear relationship between the seed numbers in the soil and the seedling numbers in the field for all the grasses and for most broadleaf weeds. For some species, like *Trifolium repens*, only a weak relationship was observed. In the case of *Chenopodium album*, which had the largest seed bank, there was evidence of asymptotic behavior, with seedling emergence leveling off at high seed numbers. An estimate of the soil seed bank combined with knowledge of the germination and behavior of specific weed species would thus have good potential for predicting future weed infestations in maize fields.

(This abstract was cited from *Weed Biology and Management*, Vol. 6, No.4: 228-234, with permission of Dr. Anis Rahman)

The Best Paper Award of *Journal of Weed Science and Technology*

Improved control of bacterial wilt of potato using *Geranium carolinianum* L.

Atsushi Ooshiro, Kazuko Takaesu, Satoshi Taba, Mika Uehara, Yoshihumi Takaesu, and Yukikazu Iraha

The incorporation of dried aerial tissue of *Geranium carolinianum* L. to soil was more effective than chemical treatments in preventing bacterial wilt of potatoes. This finding suggests that *G. carolinianum* L. could be used as a biological agent for the control of bacterial wilt of potato. This method may be widely used in the area west of Kyushu. This control method is simple as an agricultural technology. This method is environmentally friendly, as it uses straws as mulch instead of polyethylene film. This method is cost effective and very practical.

(This is summary and comments by editorial board chairman of *Journal of Weed Science and Technology*. Original paper is short report in Japanese without English summary published in the *Journal of Weed Science and Technology*, Vol. 51, No.1: 28-30.)

News from Pakistan

1. Pakistan Researcher looking for Ph.D. opportunity

Mr. M. Naeem Mushtaq, is a Research Fellow on weed science in the Department of Agronomy, University of Agriculture, Faisalabad, Pakistan. He graduated with a Gold Medal in B.Sc. (Hons) Agriculture (Agronomy) and also stood first in his M.Sc. (Hons) from the University of Agriculture, Faisalabad.

Naeem's M.Sc. (Hons) dissertation was "Reducing herbicide dose through combined application of allelopathic plant water extracts for weed management in maize (*Zea mays* L.). He is now looking for a scholarship to obtain his Ph.D. from a foreign university.

If an opportunity exists for him, Naeem would like researchers to kindly inform him at **mnaeemmushtaq@yahoo.com**; Phone: +92 333 9947133.

Naeem Mushtaq

2. Weed Scientist from North West Frontier Province Agriculture University continues studies at Ohio, USA

Zahid Hussain, a Ph.D. student of Professor Khan Bahadar Marwat, is now at the Ohio State University USA, working as a visiting scholar for 6 months. His placement is with Dr. John Cardina (cardina.2@osu.edu), at the Department of Horticulture & Crop Sciences, Ohio Agricultural Research & Development Center (OARDC). OARDC is the research branch of the College of Food, Agriculture and Environmental Science of the Ohio State University.

The Higher Education Commission of Pakistan sponsors Zahid's visit and the work will involve interference between maize and cocklebur (*Xanthium* spp). In addition, Zahid will work on statistical analysis of field data that he had collected in Pakistan.

Zahid Hussain

His contact details are: Zahid Hussain, Visiting Scholar, Dept. Horticulture and Crop Sciences, OARDC, Ohio State University, USA; Phone: (H) 001 330 264 7523; (O) 001 330 263 3827; E-mail: **zhussainpk135@yahoo.com**

Points of View

Peter Michael, a past President of APWSS provided the following 'Point of View'.

In recent years so much research energy has been devoted to the potential threat to natural biodiversity of new plants introduced to Australia that work on plants already established as weeds has been neglected. I am thinking especially of well- known plants with thorny fruits like Emex australis (three-cornered jack), Tribulus terrestris (caltrop) and Cenchrus longispinus (spiny burr grass), Alternanthera repens (khaki weed), the nuisance plant Bidens in all its forms, whose fruits stick to every conceivable piece of clothing, and the sharp fruits of Soliva in turf, a menace to anyone with bare feet.

In 1990, a Workshop on Emex, Tribulus and Cenchrus in vineyards was held in Mildura, Victoria (published in Plant Protection Quarterly 5(3) pp. 84-131, 1990) where the problems confronted by the dried fruit industry were clearly stated. These plants are, however, of great significance to the general public in very many different situations—country towns, sporting fields, showgrounds, footpaths, bicycle and walking tracks, footpaths—over a large part of Australia.

Who knows how long this season's crop of burrs of three-cornered jack and caltrop will remain harmful to us or capable of puncturing a bicycle tyre? Who has seriously tried to eliminate Bidens from an area of parkland or along walking tracks by constant vigilance and action? Is it possible?

Perhaps we could test the statement by Theophrastus (370- 285 B.C.E.) in his Enquiry into Plants Book VIII Section VII par.2---here translated by Sir Arthur Hort- that " chick-pea destroys weeds, and above all and soonest caltrop "

Peter W. Michael February 1 2008

Response:

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I agree with Dr. Michael that the biology of some common weed problems have yet to be resolved locally. In my three years (2005-2007) in NZ as Arable Market Manager for Syngenta, we identified and separated two species of wild oats (Avena fatua and Avena ludoviciana), which commonly occur together in cereals. These species are generally lumped together as wild oats. Differences in germination patterns and dominance, however, support their separation.

Avena fatua tends to germinate over the autumn and spring period. Avena ludoviciana germinates during the winter period when there is sufficient deep vernalisation. This could be the reason why it is called winter wild oat in U.K. Avena fatua is more dominant than Avena ludoviciana, because the former produces more seeds in each panicle and more germinated seedlings over a wider range of temperatures in a season than the latter.

We also found that there are at least three species of Phalaris in cereals. They are Phalaris minor, Phalaris aquatica and Phalaris paradoxa. There has been confusion in their identification especially in the seedling stage when they all look similar. The stem base of Phalaris minor seedlings turns green when pressed between fingernails, while that of Phalaris aquatica turns red. Phalaris paradoxa does not seem to occur widely as one thought. In fact, we have recorded that Phalaris aquatica, grown as fodder in the past, is more widespread than Phalaris paradoxa.

Post-emergence control of these species with herbicides needs to take account of the species, particularly Phalaris aquatica, which could germinate from seeds and/or tubers.

Editor's Note:

Please send your contributions and feedback on this opening 'Point of View' and/or any other significant 'Point of View' that you hold and would like to share with others. The objective is to stimulate some interesting discussions.

Editor's Note:

The following article, sent by Khawar Jabran, should stimulate some discussion among weed science colleagues. For instance, are allelopathic phenomena strong enough to allow for manipulations in the field to increase crop production within sustainable agriculture frameworks?

Please send your views.

Allelopathy for sustainable weed management

Khawar Jabran and Dr. Muhammad Farooq

University of Agriculture, Faisalabad, Pakistan-

Weeds are obnoxious plants interfering with the crops by harboring insect pests, disease pathogens, hindering cultural practices and harvest operations, depriving crop plants of the growth substances including water, space, CO_2, nutrients and light, ultimately causing economic losses and increasing cost of production. The average losses in crop yields caused by weeds are estimated to be approximately 5 percent in developed countries, about 15-25 percent in less developed countries. Thus, successful crop production requires suppression of weeds in agro-ecosystems to minimize the losses.

Allelopathy is the natural phenomenon that involves the exudation of certain molecules termed as allelochemicals by the plants in the rhizosphere. The allelochemicals are found in all plant parts including roots, stems, leaves, branches, fruits and seeds and released into the environment through roots of growing plants, by the decomposition of plant parts, volatilization from the plant surfaces and leaching in the water from dead plant parts (Rice, 1984; Weston, 1996).

Allelopathic phenomenon can be incorporated for sustainable weed control in the form of various strategies that include mulching, cover crops, crop rotation, allelopathic water extracts and breeding crops to strengthen their allelopathic potential (Bhowmik et al., 2003).

Mulch is the covering provided to the soil surface by application of crop residues. Allelopathic crop stuff is employed as mulch in field crops to depress weeds by release of allelochemicals. In addition, the mulches obstruct weed growth by blocking sunlight to reach the weeds and exerting a physical effect on them. Crops that can be used as material for allelopathic mulch are alfalfa, sunflower, rice, sorghum, wheat, barley, canola and rye. They can be used as mulch either alone or combined, however, a combination of different crops will contain diverse allelochemicals to suppress weeds intensively. Mulches can be applied @1-3 t ha^{-1} to effectively suppress the weeds (Khanh et al., 2005). For instance, alfalfa mulch applied in rice field at 2 t ha^{-1} 2 days after sowing reduces the intensity of noxious weeds including barnyard grass, jungle rice and purple nutsedge by more than 70 percent and increase paddy yields by 20 percent. Similarly, the sorghum and wheat residues mulch applied in maize suppresses the weeds by more than 60 percent. The mulches possess the additional benefits of organic matter addition to soil, erosion control, soil moisture conservation and temperature regulation.

Crop rotation involves growing of dissimilar crops on same peace of land in a changing sequence to manage weeds and other pests. Allelopathic crops are integrated in the rotational sequence to discourage weeds emergence. The allelochemicals exuded by the roots and the remains of allelopathic crop in rotation not only restrict weeds in the present season but also suppress the weeds of the following crop. The weeds that get associated with a certain crop are controlled due to obstruction of their life cycle by crop rotation. For instance, the wheat fields that are badly infested with noxious weeds like wild oat, canary grass, lambsquarters etc. can be put under berseem for one season to break the intensity of these weeds. Crop rotation has the several other settlements as balance removal of nutrients from soil, augmenting crop diversity and improving soil productivity.

Cover crops are grown for their abilities to control weeds, conserve soil, suppress insects, nematodes and other disease pathogens, enhance nutrient recycling and supply fodder. Important cover crops include alfalfa, mung bean, mash bean, red clover, sorghum, lucern, yellow sweet clover and ryegrass etc. Decomposing residues of cover crops augment nutrient status of soil and release allelochemicals that deter plant pests including weeds, insect pests and soil borne disease pathogens. Allelopathic cover crops hinder the weed growth by delivery and accumulation of allelochemicals in the rhizosphere. In addition, they compete with weeds for water, light, air and space and suppress them by shading effect. Cover crops can be incorporated into the soil as green manures to add organic matter to soil.

Allelochemicals can be extracted from dead plant parts in water, oil or even in powder form to be used as herbicides. For example, allelochemicals extracted from sorghum by soaking in water can lower the weed growth in crop plants by more or less 45 percent and increase crop yield by more than 5 percent.

Allelopathic phenomenon can be inserted into conventional crop varieties through breeding or DNA recombination to enable them to synthesize their own herbicide for suppressing weeds. Cultivars can also be selected for their allelopathic potential as for example; most of sunflower varieties have been identified to show allelopathic suppression against a number of weed species including wild oat, parthenium, wild mustard etc (Anjum and Bajwa, 2005). Moreover, biotechnology can be employed to produce allelopathic crop plants capable of producing natural phytotoxins to fight against weeds.

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News about Forthcoming Conferences

5-8 May 2008	**XVIII Congress Latin America Weed Science Society (ALAM)** and the **XXVI Congress of the Brazilian Weed Science Society** (Joint Meeting). More information can be obtained by email: **26cbcpd@cnpms.embrapa.br**
18-22 May 2008	The **16th Australian Weeds Conference-** '***Weed Management 2008 – Hot Topics in the Tropics***' will be held during 18-22 May 2008 at the Cairns Convention Centre, Cairns, in Queensland. Further information can be obtained from **16awc@eventcorp.com.au** or **www.16awc.com.au**
23-27 June 2008	The **5th International Weed Science Society Conference** is to be held in Vancouver, British Columbia, Canada from 23-27 June 2008. Program Enquiries: **http://iws.ucdavis.edu/5intlweedcong.htm**
11-14 August 2008	The **New Zealand Plant Protection Society Conference** is to be held at the Copthorne Hotel, Paihia, in the Bay of Islands. Conference details are at: **www.nzpps.org**
10-13 September 2008	The **First International Ragweed Conference** is to be held in Budapest, Hungary. Conference details are at: **http://www.nki.hu/ragweed/index.html**
21-25 September 2008	**5th World Congress on Allelopathy.** The International Allelopathy Society will hold its triennial congress in Saratoga Springs, NY. For further information go to the website (**www.iascongress5.org**).
9-11 March 2009	**European Weed Research Society Workshop: Physical And Cultural Weed Control**. To be held at: Zaragoza, Spain on the Campus of Aula Dei. Full information at: **http://www.ewrs.org/pwc/**
26-29 July 2009	**10th Queensland Weeds Symposium** To be held at Rydges Capricorn, Yeppoon. For more information, contact the chair of the organising committee, Trudy Baker, or look for future updates on the WSQ website: **www.wsq.org.au**

Other 'Weedy' News

Mayaca fluviatilis (Bog Moss)- A new Aquatic species found in NSW

Peter Harper (peter@bettersafe.com.au) provided this news item and the photograph of *Mayaca.*

A recent aquatic infestation of *Mayaca fluviatilis* was found in a private property on the mid Central Coast of New South Wales, north of Taree. The infestation was firstly mis-identified as *Lagarosiphon*, because the habit appeared similar.

However, a further investigation by NSW DPI and the Local Council officers eventually established the identity of the potentially invasive species as Bog Moss- *Mayaca fluviatilis*.

The plant has now invaded the 3 hectare pond and several smaller ponds located downstream with almost 100% cover in some cases.

Mayaca is a submersed plant. It may be found in water several feet deep, such as in streams, ponds, springs, and lakes. It will grow readily as a submerged plant, and then emerge above the water.

The stems can be long, up to 1.0 m or more in water; the leaves are soft, about a cm long under water, and are arranged spirally on the stems. The plant produces a small purple flower on extended tips, as it emerges above the water.

Mayaca has been identified in several States of USA as a potential invader of aquatic habitats. The level of infestation at the NSW property in a clear indication of that potential. There is concern whether it has spread beyond its present location in NSW and its invasive capacity, which is being accessed by NSW DPI.

Mayaca is a readily available Aquarium plant, advertised widely by the aquarium trade through the internet. It is thought that the plant was introduced at this NSW location accidentally, but may have been imported many years ago as an aquarium plant by an enthusiast.

Presently, there appears to be no known control agents for *Mayaca*. However, the owners of the NSW property have contacted Peter Harper from Bettersafe Pest & Weed Management to conduct some trials with Hydrogel (incorporating Diquat) in efforts to control this potential invader.

Editor's Column

Issue 1 (January 2008) of our new APWSS Newsletter was well received by the Membership. Based on the feedback I received, the type of the information that the Newsletter provided was useful to many people, and its format was acceptable.

I am hopeful that the Membership will continue to provide relevant and interesting 'weedy' information that will make this Newsletter grow in importance in the Asia-Pacific Region.

Several Country Representatives and individual members have made significant contributions to this **Issue 2 (April 2008)**; I am thankful to them, and am hopeful that this trend will continue.

This current issue is somewhat biased towards India and Pakistan, because much of the information on Conferences have come from them. However, Hongjun Zhang from China, Dr. Jun Ushiki from Japan and colleagues from Australia have provided some interesting news, which redresses the balance to some extent.

As Newsletter Editor, I requested our partner Industry to participate more in sharing of information. There is an indication that the Industry may take up this offer and respond positively. If the Industry finds this vehicle of information useful and worthwhile, I am sure that the Newsletter will prosper, and so will the Society.

Again, I'd like to state that the material in the Newsletter comes directly from contributions, with minor editing from me in some cases.

I hope the readers will find this Issue also stimulating.

I have slipped Khawar Jabran's article on Allelopathy as a 'Point of View', hoping that this would stimulate some discussion. Whilst we now have plenty of evidence of allelopathic phenomena in nature, do we all agree to the same extent that these interactions can be effectively manipulated to suppress weeds in most agro-ecosystems? Or, are their uses limited to some situations? Should these plant interactions be seen an essential component of any integrated weed management solution that we prescribe? Please send your views.

I will remind everybody again; kindly distribute the Newsletter as widely as possible, so that we promote collaboration among Weed Scientists particularly in the Asia-Pacific Region, and also amongst our Industry Partners.

The next Newsletter will be in July 2008. I am therefore requesting that all contributions to the next Newsletter and any other feedback on the current Issue be sent as soon as possible. Now that the Newsletter is 'on the way', I encourage Country Representatives to provide interesting news from their respective Weed Societies and activities.

Thank you

Dr. Nimal Chandrasena

Newsletter Editor, APWSS

Nimal.chandrasena@gmail.com