

# NEWSLETTER

Number 4

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PRESIDENT Roger Cousens

SECRETARY Leon Smith

TREASURER Geoff Jacobs

**THE WEED SOCIETY  
OF NEW SOUTH WALES**

EDITOR Deirdre Lemerle

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## AGM and Annual Dinner

The 27th AGM was held in Sydney on 27 November, following a lively seminar on "Future of the NSW Weed Society" was attended by about 25 members. The Annual Dinner held at the Curzon Hall the previous evening was enjoyed by about 30 Society members and friends.

At the AGM the following Office Bearers were elected for 1993:

President: **Roger Cousens**, Sydney Uni

Vice President: **Alan Murphy**, Dow Elanco

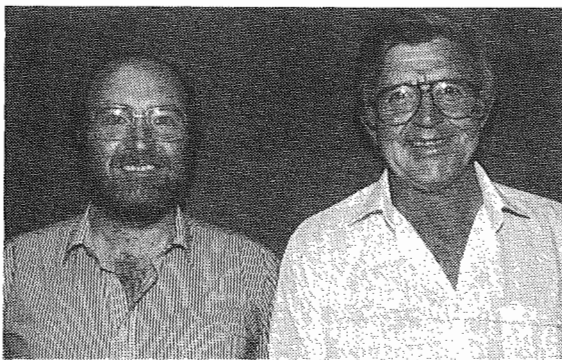
Secretary: **Leon Smith**, Consultant

Treasurer: **Geoff Jacobs**, DuPont

Immediate Past President: John Toth

Executive Committee: Jim Cherry, John Abbott, Peter Michael, Deirdre Lemerle, Mike Barrett, Jim Swain, Alex McLennan, Brian Sindel, John Cameron, Laurie Greenup, Graeme Anderson, Bob Trounce and David Theriault.

The new Committee wish you all a very happy Christmas and prosperous New Year. We hope to organise some interesting activities during 1993 and we look forward to the enthusiastic participation of all Society members. Below are Roger Cousens (left) and Alan Murphy (right).



## Annual Report

by Mike Barrett

This has been another busy year for the Society which has enjoyed a small growth in membership. The Society made a submission to the Landcare Interim Plan for New South

Wales and has forged links with this organisation. This initiative has been passed to CAWSS to assist member societies with contacts. The National Weeds Strategy Draft Report, prepared by L. Smith, has just been made public and it is hoped to compile a response in the limited time available. A membership brochure has been produced which was used at our display at Agview at Camden and will be most useful. Two Weeds Prizes were awarded this year at Sydney University and the University of New England. A Travel Study Grant to the value of \$1,000 was awarded to Malcolm Campbell to assist his visit to USA to investigate serrated tussock.

A CAWSS Medal was awarded to Warwick Felton (shown below) at the International Weeds Congress in Melbourne. Warwick is a Past President of the Society and is a worthy recipient. Several members attended this Conference which was considered most successful.

We agreed to provide an award for the Best Poster at the Noxious Weeds Biennial Conferences. Guidelines have been drawn up for the next Conference in April 1993.

There have been a number of activities during the year organised by the Society which have not been well supported except for the Annual Dinner. These included a function at Orange where Andrew Leys, Brian Sindel and Warwick Felton reported on their recent work or visits, the former being Travel Study Grant recipients. An Urban Weeds Field Day in Sydney was organised by Judy Rawling and Roger Cousens in September. This was most interesting. It is to be hoped that our Symposium "The Weeds Society of NSW in a Changing Environment" provided an opportunity for the Society to start to examine its future directions.

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## REPORTS

### Workshop on "The Weeds Society of NSW in a Changing Environment"

Summary by Warwick Felton

The primary objectives of the Society set in 1966 when it was established were designed to promote the wider interest in weeds and their control, and to provide opportunities for the exchange of information. This meeting concluded that in general this had been achieved, but the question now to be addressed is: Have the objectives of the Society changed?

The wider community has more interest in weeds today than in 1966. The Society must recognise and service this while still maintaining its primary commitment to the members who are the primary audience.

Societies in several other states have become more general, for example the Crop Science Society of SA in 1987 incorporated the previous Weed Society. This expanded membership and is functioning successfully with well attended seminars and 8 newsletters each year, but weeds are less significant in the total picture. This obviously suits their situation but is not considered to be necessarily so in NSW because of the more diverse distribution of agriculture and members in NSW.

A major change in demand for information in NSW has been in urban and bushland areas. The Society has recognised this group but needs to do more in fostering educational institutions to do research on urban and bushland weed problems and to facilitate dissemination of more factual information on these subjects. Conservation and Land Management (CaLM) has a much more important role in weeds than did the previous groups now amalgamated in this department because of the success of LandCare. There are now 402 LandCare coordinators and these should be targeted by the Society.

The Society can assist in education but with the number of secondary schools and tertiary institutions that exist it is necessary to get more involved in the preparation of information in publications and videos.

The discussion groups at the Workshop concluded that the Society should continue to focus on weeds and their control and not be persuaded to become more general, solely to expand membership numbers. However, there is considerable scope to broaden the interest in weeds and to improve the Society's performance. Furthermore, we must develop closer affiliation with the activities of related groups such as AIAS, Agronomy Society and Grasslands Society.

It was recommended that the incoming committee review the aims of the Society to accommodate the changing status of weeds and of those groups with an interest in weeds and their control.

Notes of this Workshop will be circulated to members in 1993.

### Report of Urban Weeds Field Day

by Mike Barrett

This interesting day was organised by Judy Rawling and Roger Cousens but was unfortunately poorly attended. The first stop was the Kur-ing-ai Flying Fox Reserve at Gordon where Elizabeth Hartwell explained the bush regeneration work to control Lantana and Morning Glory which was started in 1987. This project was a combination of volunteers and contract teams with Environmental Trust funds. Elizabeth pointed out the need for funding for at least three years, and the need to leave weed barriers for birds. The area examined has now been deserted by the bats who prefer bush with some understorey vegetation which is absent in the early stages of regeneration. In addition a number of mature Blackbutts have died probably mainly due to increasing urban runoff and nutrient stress. The bats are tolerant of volunteers' activities.

The contract teams are able to burn after

much negotiation with the Council. This is very beneficial particularly for stimulating turpentine seeds to germinate.

A number of rainforest trees which are spread by the bats were in evidence. These included two species of Sandpaper fig (*Ficus fraserii* and *F. coronata*) the former is rare in this area and Stinging tree seedlings.

One of Judy's teams was working on a Water Board project in the Lane Cove river Catchment which was the next visit. This project was started in 1989. There have been problems as 6 Local Governments and the National Parks and Wildlife Service are involved, apart from soil erosion, flooding and vandalism.

Judy has persuaded the Water Board to enlarge the treated river margins from 3 m to 20 m and to treat the catchment areas upstream first. The main weeds are Privet, Maderia and Baloon vines. These are mainly cut and stump treated with Roundup but they must be treated quickly after cutting or scraping. Larger trees are drilled and injected. The timing and planning of various operations is important.

Judy has some 30 projects in hand in the Sydney metropolitan area employing 65 staff who are all TAFE qualified. Margaret Mathers was in charge of this project and has a very good collection of colour photographs showing various bush regeneration techniques. Judy gave interesting data derived from many projects. For primary weeding in the first year with heavy weeds 4.4 m<sup>2</sup> per person per hour was the average work rate. In years 2 and 3 this could increase to 80 m<sup>2</sup>/person/hour.

Finally we visited Campbell Park at Chatswood. This small area is being regenerated by contract with Water Board funds and looks very promising. These projects reflect the interest in preserving urban bushland in Sydney, and demonstrate that weed control programmes are essential and successful

## Summary of 1992 Meeting of the Australian Weeds Committee (AWC)

The AWC met in Perth in June 1992 and below is a summary of the proceedings of that meeting.

### 1. Weed species and biology

- **Match-head plant** (*Psilocaulon tenue*).

This perennial South African plant may become a nuisance in calcareous marginal cropping areas of SA.

- **Water dropwort** (*Oenanthe pimpinelloides*). Water dropwort is a perennial weed of pastures, adapted to areas that are periodically flooded. At Meadows, SA, it has increased from 8 ha in 1981 to 200 ha in 1992, and continues to spread. Water dropwort was proclaimed as a pest plant in SA in 1991. No herbicides are registered for its control and field research has not identified any promising treatments.

- **New cruciferous weeds.** Three species have emerged as crop weeds in SA under farming systems involving herbicides and continuous cropping. Nightstock (*Matthiola longipetala* ssp. *bicornis*) has rapidly spread in cereals, grain legumes and oilseeds in SA since 1985, and is established in western Victoria. It is not controlled by the common herbicides used for cruciferous weeds although more expensive alternatives may reduce crop losses. *Malcolmia africana* was identified in SA in 1988. It is a common weed in Kashmir, and in Iran through to the Mediterranean Sea. It is considered a noxious weed in North America. *Calepina irregularis* was identified in SA in 1986 and is restricted to less than 100 ha on Yorke Peninsula.

- **Weed potential from African Acacia species planted in zoological gardens.** WA is concerned that southern African *Acacia* species introduced for planting in an African exhibit at the Perth Zoo may have weed potential in Australia. The species are *A. arabica* (= *A. nilotica*), *A. Giraffe* (= *A. erioloba*) and *A. xanthophloea*. WA is also concerned that the sale of "Zoo Poo" may spread seeds of exotic weedy species. AQIS

will take up this issue.

- **Kochia** (*K. scoparia*) has been introduced into WA and promoted by a Perth-based seed merchant as an annual forage species suitable for salt-affected land. It was planted on salt scalds on 9 farms in WA in 1990 and on a further 50 in 1991. It soon spread from some of the original plantings and colonised non-saline sites in paddocks and road sides. A review of the literature revealed that this plant has many undesirable features and was recognised as a toxic, allelopathic weed of a wide range of crops in USA, Canada, Argentina and parts of Europe. In view of these concerns, it was decided that kochia was a threat to agriculture in WA, and to the rest of the country. It was proclaimed as a declared plant in WA in 1992.

- **Athel pine** (*Tamarix aphylla*). Seedlings of *T. aphylla* were identified from the bed of the Gascoyne River at Carnarvon. It is likely that many of these would have been destroyed by subsequent heavy river flows. As yet there is no policy for control of any survivors. US Department of Agriculture (USDA) is willing to supply information from its biological control program that is relevant to Australia. Jim Cullen wishes to send Australian seed of *T. aphylla* to USDA and asked for help to locate and collect material.

- **Mimosa Control Program.** AWC was briefed on progress with control of an 8200 ha infestation of *M. pigra* on Aboriginal land near Oenpelli in NT. The infestation is close to Kakadu National Park and proposals for mimosa control were developed as a five-year management program, originally agreed inter-departmental discussions in 1990 and then defined in a Public Environment Report. Funding for the project was sought from the Commonwealth Government under a specific grant separate from the ongoing mimosa control program funded by NT. The Commonwealth contributed \$2 million to the Oenpelli project in 1991-92 but there is no commitment to further funding. Follow-up control must be carried out for the program to be successful. The management plan depends on ensuring that the weed does not recover and the \$2 million invested in 1991-

92 will be wasted if continued funding for follow-up control is not forthcoming. AWC strongly recommended that the Commonwealth provide funds for continuation of the project, as outlined in the Public Environment Report.

- **Fiddleneck** (*Phacelia tanacetifolia*). This species was widespread as a weed of cropping areas of Tasmania in 1992 following its occurrence as a contaminant of forage brassica seed imported from NZ. It will be monitored to assess its likely significance as a weed in Tasmania but is probably too well established for eradication.

## 2. Herbicide use and side effects

- **Herbicide resistance in crop weeds in WA.** A survey of annual ryegrass populations in WA in 1991-92 showed that sulfonylurea (SU) resistance is looming as the largest problem. 33% of samples had SU resistance only. 27% had developed resistance to SU herbicides through repeated use of the "fop" herbicides (multiple or cross-resistance). Use of "fop" herbicides appears to select for some general resistance mechanism but use of SU herbicides does not.

- **Guidelines for herbicide evaluation on woody weeds.** The document replacing Section 17 (Control of unwanted tree and shrub growth) in the publication "Guidelines for field evaluation of herbicides" has been printed. Copies are available from Agricultural and Veterinary Chemicals Unit, DPIE.

- **Flexibility of herbicide label rates.** AWC considered arguments that lower-than-labelled use rates of herbicides have economic and environmental benefits. AVCA or chemical companies can not endorse below-label rates although they acknowledge that lower rates may be effective under some conditions. Label rates must be set at a level that will ensure efficacy under a range of conditions. Users who choose to lower rates will do so at their own risk. AWC recommended to Australian Agricultural and Veterinary Chemical Council (AAVCC) that legal use of below-label rates for herbicides be embodied in the

new Commonwealth and State agricultural chemicals legislation.

### 3. Regulatory aspects

- **Revision of Quarantine Proclamation 86P.** AWC considered a draft Schedule of species of prohibited plants (Revised 86P) and supporting documents. The Schedule draws together the following lists:

- A. Exotic plants not known to be present in Australia but weeds elsewhere.
- B. Exotic weed species present in Australia but not included in State legislation as noxious plants.
- C. Plants considered a danger to humans. Listed on the Customs schedules of prohibited plants.
- D. Acacias - list from Proclamation 95P of weedy, spiny or thorny exotic species.
- E. Noxious and prescribed weeds in State and Territory legislation.
- F. Cacti-list from Proclamation 58P.

AWC endorsed the draft schedule and supported AQUIS' effort to develop a rational scientific basis for the listing of species. Despite this endorsement, AWC supported further revision of Quarantine procedures in accordance with recommendations made in the draft National Weeds Strategy. In summary, this strategy proposes that:

"The Commonwealth will investigate adopting the system used for determining imports of animals and fish, where a list of species allowed entry into Australia is the basis for regulation of entry, not a prohibited list as occurs with plants.

- **Revision of scoring system for decision on importation of plants.** AWC considered a paper by Dr. Dane Panetta, which discussed inadequacies with the current scoring system and which proposed an amended screening procedure based on a "flow-chart" approach.

AWC agreed to the draft National Weeds Strategy recommendation that, in consultation with AQIS, it should review the existing scoring procedure, using the proposals of Panetta and Mulvaney to refine procedures.

- **National data-base on registered**

**herbicides and off-label uses.** The AAVCC Working Party on organisation and administration of the national registration scheme agreed that a computerised management system was necessary for operation of the scheme. This would include data-bases of registered herbicides and label information.

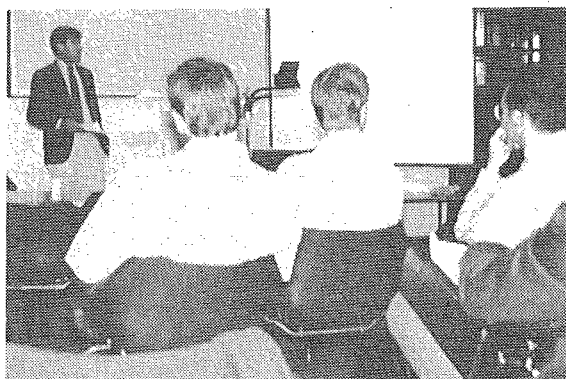
Victoria will upgrade its Chemical Registration Information System (CRIS) by including products registered in other States. This will then be purchased by AAVCC and maintained by DPIE (Agricultural and Veterinary Chemicals Unit). Means of accessing the system is yet to be determined. There is no intention to establish a national data-base on off-label uses. The major factor preventing many off-label uses becoming registered is lack of MRL's.

### 4. Communication and extension

- **International Workshop on Management of *Mimosa pigra*.** AWC was informed of this workshop, which was held in Darwin in May 1992. A booklet entitled "A guide to the management of *Mimosa pigra*" was the principal resource material for the workshop, and copies are available from Ian Miller, Dept of Primary Industries and Fisheries (NT) for \$10 each.

- **Standardised plant names and computer codes.** This publication is with the CSIRO printer in Melbourne, at the proof-reading stage. It should be available by the end of 1992.

Ian Black (SA) was nominated as Chairman for AWC in 1993-94 and Hobart is the venue for the next meeting in 1993.



## Herbicide Resistance in US and Canada

Report by John Matthews recipient of the 1992 Churchill Badman Fellowship Study Tour

The north western states of the US and the prairies of Canada are single cropped wheat growing areas. This cereal ecosystem has grassy weeds similar to southern Australia; Italian ryegrass and wild oats in Oregon, brome grass and wild oats in Idaho and Washington, wild oats and green foxtail in the Canadian and North Dakota prairies.

The broadleaf weed spectrum is more complex, but Kochia, Russian thistle and the mustards are the main species with many other important local species. The incidence of herbicide resistance in these regions is varied but in a few areas it is nothing short of alarming.

In Oregon there are at least a hundred sites with Italian ryegrass resistant to the "fops and dims" and the number is increasing annually. At present they have alternative chemicals, triallate, diuron and metribuzin for control in wheat but when these fail they have no other products. There are options for alternative crops so most growers switch to forage, clover or grass seed production when the problem becomes unmanageable.

In my opinion, the biggest problem is resistant wild oats, both "fop and dim" and triallate resistant. There are a 100 or more populations in eastern Canada, 20-30 in Alberta and 60-70 in central Montana which have all been identified in the last 1-2 years. This rapid increase in the extent of the problem has caught everybody by surprise. Will we be surprised when it happens here?

At present control is achieved by switching from one group to the other, or to alternative products but these are not very effective and may fail eventually. Australian farmers who depend on selective wild oat control at present should be reviewing rotations and alternatives. It seems to be a question of

when, not if, resistance develops.

Resistance in broadleaf weeds to ALS inhibitors is widespread in the drier states where Glean was used for fallow and in-crop weed control. The principal weed to develop resistance is Kochia but four other species have also developed resistance to ALS inhibitors. Will it be the same in Australia with the ALS inhibitors, a question of how much resistance, not when, or if, for the onset of resistance in broadleaf weeds?

The control of the broadleaved weeds is less complex as there are other products that can be selective, however if you have a cropping system that relies on the ALS inhibitors you should be aware that they may fail on some broadleaf species.

Paddock planning including use of herbicides, must take account of the probability that resistance may eventually render selective herbicides useless. There are several aspects to the issue and they can only be dealt with individually. Suitable rotations with a variety of weed control techniques, and planning herbicide use with variety and effectiveness must be considered. The propensity of ryegrass to become cross-resistant makes this difficult.

For other species herbicide rotation is sensible. Herbicide use needs to be coupled to an understanding of the biology of the weeds, the rate of increase, when herbicide use is necessary and when it is effective.

In the US and to a lesser extent, Canada, agriculture is, largely, a political activity. Herbicide resistance has developed rapidly under continuous herbicide use often in continuous cereal rotation. Continuous cereals are partly the result of the Government price support scheme in the US and partly for their ease of management.

To qualify for price support, stability of rotation is rigidly enforced plus there is little price support for alternative crops, with the exception of canola seed, for which du Pont

are offering some price support. So, like here, the profitability of the rotational phase is important to the management of herbicide resistance.

In North America, sustainable and creative weed control is the province of farmers who tend to be outside the mainstream. Some green manure or plough down is done for weed control and for nitrogen input. Intercropping or mixed cropping is popular and has some real weed suppressing effects.

Alfalfa for forage is very effective but it grows very vigorously and totally covers the ground for most of the time between cuttings. Other crops used in rotation are sweet clovers, winter and spring peas and lentils. Some cultivation on weeds is done after crop emergence, although the results can be a bit variable. An interesting piece of machinery for post-emergent cultivation is a rolling harrow, it may be effective for incorporation of preplant herbicides into retained stubble. Equipment to catch ryegrass and perhaps other weed seeds from the back of the harvester was not in use but some blower type units were used once and I have descriptions if anyone is interested. Another cunning idea is the use of a laser beam to cut heads from weeds that stand above a crop. The technology is not difficult, perhaps it has a place here!

*(From Crop Science Society of SA Newsletter No. 112, September 1992).*

## Recommendations of the Draft National Weeds Strategy

A draft of the National Weeds Strategy was released for public comment in late November. A summary of the draft recommendations is given below.

### 1. Review of Commonwealth quarantine legislation

A screening system or risk analysis assessment method is required that evaluates proposed plant introductions on the basis of their potential to become invasive in Australia in both agricultural and

conservation areas. Primary considerations should be whether the plants are recognised as weeds overseas or possess noxious characteristics. Any species posing a potential risk should be excluded unless the importer can show that it is most unlikely to become a weed. The cost of this process should be borne by the importer. Specific actions required are:

- review of the *Quarantine Act 1908* and complementary legislation to ensure that a legal basis exists for a more stringent plant introduction procedure; and
- denial of automatic entry for proposed introductions that may pose a threat, and the introduction of a requirement for risk-analysis assessment paid for by the importer.

### 2. Review of State and Territory legislation

While each State and Territory has the right to legislate and prescribe procedures for noxious weed control, anomalies should be eliminated - for example, in relation to sale and transport of weeds and weed-contaminated stockfeed and produce. A working party should be established to review existing Commonwealth, State and Territory noxious weeds legislation with a view to implementing a uniform system. Legislation should bind governments to control noxious weeds on public land.

### 3. National coordination

A National Weed Management Coordinator should be appointed. The Coordinator, who will act as permanent secretary to the Australian Weeds Committee, will:

- develop an operating plan to implement the strategy,
- develop the new plant introduction legislation in liaison with the Australian Quarantine and Inspection Service (AQIS) and the Australian National Parks and Wildlife Service (ANPWS);
- develop with the Commonwealth, States and Territories a model action plan for handling weed outbreak emergencies;
- identify management directions that can provide an effective basis for regional and local action;



- promote integrated management of weeds in accordance with sustainable land use and conservation principles; and
- act as convener of the working parties proposed in Recommendation 4 and drive Recommendations 5 and 6.

#### 4. Research and development

A weeds working group system should be set up to identify research and development priorities and co-ordinate the R & D effort. Members should be drawn from CSIRO, departments of agriculture and forestry, conservation authorities, tertiary education institutions and industry bodies. Areas of responsibility of the proposed five working groups are:

- tropical and sub-tropical crops and pastures;
- temperate crops and pastures;
- aquatic habitats and ecosystems;
- environmental - forests; and
- environmental - rangelands.

Initiatives in research should include:

- work on the prediction and prevention of weed spread;
- long-term ecological and autecological investigations;
- research on integrated weed management, with a view to reducing reliance on herbicides;
- development of policies for research into herbicide resistant cultivars of crop and pasture species;

- monitoring of herbicide residues in soil, surface and ground water and the environment generally;
- development of weed management strategies based on sound ecological principles and economics; and
- post-control revegetation and the rehabilitation of ecosystems.

#### 5. Public awareness and education

Successful implementation of the Strategy will require increased public awareness, educational support and community involvement to ensure that the economic, social and ecological impacts of weeds are recognised across the nation. It is essential that weed management be promoted as an integrated part of ecologically sustainable development (ESD). Specific awareness and education programs should focus on:

- the benefits of preventing weeds from entering Australia and the need for weed seed hygiene in the use and transport of seed fodder and machinery;
- the significance of weeds in relation to land degradation and resource management in natural and agricultural ecosystems;
- addressing public concern about the use of herbicides and their effects on human health and the environment; and
- establishment of a national TAFE-based course for the licensing of weed control operators, after revision of the various existing courses.



### 6. Operational matters

A catchment management approach to the co-ordination of weed management strategies, based on existing groups such as Landcare groups, should be adopted. New arrangements under the National Landcare Program should ensure that:

- community groups have access to funds for control of weeds and pest plants in rehabilitation projects regardless of any legal requirements to control noxious weeds;
- these groups receive information and financial support to enable adoption of integrated weed management practices; and
- invasive ornamental plants already present in Australia are listed for each bioclimatic region, with the lists being provided to the public and the nursery trade.

Action should be initiated to encourage landholders to plan weed management on a whole-farm basis, increase land manager's awareness of their legal responsibilities in weed control, facilitate the development of efficient weed control information systems, and ensure regional and national coordination of weed management programs where appropriate.

### Report of Symposium on Wild Oats in World Agriculture

A one day symposium on wild oats was part of the Fourth International Oats Conference held in Adelaide on 22 October 1992. The papers presented are available in Volume II of the Proceedings of the Conference (Editors A Barr and R Medd).

The objective of the symposium was to bring together weed scientists, ecologists, oat geneticists and scientists from chemical companies to consider approaches to controlling wild oats, as well as to evaluate its role in crop improvement. In addition, the emerging problem of herbicide resistance in wild oats and the related opportunity of breeding for herbicide resistance in cultivated oats were considered.

The importance of wild oats (*Avena sterilis* and *Avena fatua*) in World Agriculture was

reviewed by Harry Combella (Keith Turnbull Research Institute, Victoria), including its ecological status, occurrence and obnoxious characteristics, and its economic and intrinsic values. The need to develop control strategies less dependent on herbicides was emphasised, especially competition studies and models to predict the economic returns from such strategies.

Bruce Wilson (University of Bristol, UK) outlined the changing status *Avena fatua* in the UK over the last 20 years. Currently, wild oats are widespread at low level infestations and are not considered as important as some other species eg. brome grass and black grass. Effective herbicides since the mid 70's and a containment policy by many growers have caused the reduction in wild oat populations. It is possible that wild oats could build up if control measures are relaxed. In the future, economic pressures are likely to force farmers to rely on integrated strategies of low doses of herbicides combined with cultural methods to control wild oats. There is a risk that wild oats will build up in the 'setaside' land if it remains uncropped. Straw burning will be banned in 1993 in UK and this is also likely to exacerbate the wild oats problem.

Seed dormancy in wild oats (*Avena fatua*) and its implications for control strategies were reviewed by Graham Simpson (University of Saskatchewan, Canada). The chemical control options for wild oats were outlined by A Jutsum (ICI, UK), who noted that future developments in chemical control are less likely to be new compounds (because of the costs) but rather improving current chemicals with adjuvants, formulations and safeners.

The impact of selective herbicides on wild oats in Australia was reviewed by Dick Medd (Agricultural Research & Veterinary Centre, Orange). The use of herbicides has done little to control infestations. Wild oat control should be considered as long-term management of populations rather than short-term yield maximisation. Research is needed

to achieve better control by improving the efficiency and reliability of herbicides and to reduce seed production.

Herbicide resistance in wild oats in Canada was described by Ian Morrison (University of Manitoba, Canada). Resistance was first detected in 1990 and since then more than 60 wild oat populations resistant to the ACCase inhibitors ("fops" & "dims") have been confirmed. There is no evidence of cross-resistance to difenzoquat, imazamathabenz or flamprop-methyl. Current awareness of herbicide resistance is low amongst farmers, and the aim is to encourage rotation of herbicides with different modes of action.

Herbicide resistant wild oats in Australia was detailed by Joe Holtum (University of Adelaide, Australia). Resistance is mainly to the "fops" in *Avena fatua* and *Avena sterilis* and there are low levels of resistance to the "dims". Two mechanisms of resistance have been identified, herbicide-insensitive ACCase and ability to repolarise membranes following exposure to graminicides (Malcolm Devine, University of Saskatchewan, Canada).

Two papers (Solomon Kibite, Lacombe Research Station, Canada; and Andrew Barr SA, Dept. Agric., Australia) showed that tolerance to wild oat herbicides can be selected or screened for in domestic oats. However, there are strong arguments against doing this. Selecting for herbicide resistant crops may be dangerous and undesirable because of the risk of the resistant genes getting into wild oat populations by outcrossing with the domestic lines.

Brian Arnst (Monsanto, Australia) outlined the developments in glyphosate resistance in crops. Transformation of wheat using particle gene technology has been achieved although gene expression is still low. The problem of negative public perception were discussed and countered with the argument that this technology allows use of safer chemicals at lower rates of application. Monsanto has to consider the loss of their

market for glyphosate in controlling volunteer cereals when developing this technology.

Dr Leggett (Welsh Plant Breeding Station, UK) and Professor Frey (Iowa State University, USA) discussed wild oats as a source of breeding material for domestic oats.

A summary address was presented by Roger Cousens (Sydney University). He suggested that little improvement in wild oat control has been achieved since the last wild oat meeting in 1983, due to a lack of applied research. A number of areas requiring research were outlined:

- effects of management strategies on weed populations
- populations dynamics, ie seed fecundity and longevity and prediction and timing of seedling emergence
- competition studies in relation to crop and weed growth and development in the field (interactions of cultivar, fertiliser, seed rate, environmental conditions).
- prediction of factors affecting herbicide performance in the field
- potential of pathogens to attack seeds in the soil.

All the research must aim to reduce the impact of wild oats on crop production, reduce the seed production and carry-over in the soil, and use integrated weed management strategies to retard the rate of development of resistance to wild oats.

### Herbicide Resistance Extension Workshop

A one-day Herbicide Resistance Extension Workshop, organised by the Grains Research & Development Corporation, was held at the Waite Agricultural Research Institute, Adelaide on 21 October 1992.

The aim of the workshop was to develop a common message for farmers and industry in all States about managing herbicide resistance, and to determine the resources

needed to meet communication priorities.

Participants (55) were drawn from industry and government organisations from all over Australia, representing research, extension and chemical sales. The morning session comprised a number of formal presentations summarising activities of (a) research, (b) national committees formed to deal with herbicide resistance, and (c) extension and agribusiness. In the afternoon, delegates were split into groups to discuss the issues and to set priorities for future research and extension. Contributed papers and resolutions are available in printed proceedings (ISBN 07308 21307) from E S Hogg, SA DPI, GPO Box 1671, Adelaide 5001 at a cost of \$12.

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## FEATURES

### Killer Lens Blasts California's Weeds

Sunlight is essential for weeds to grow, but a Californian researcher has turned sunlight to work killing weeds. Dennis Larsen, a researcher with the Soup-makers Campbell's, based in Davis, California, has developed a solar-powered machine for killing weeds.

The device is pulled by hand between rows of crops and concentrates sunshine into a single band of withering light. The solar concentrator, known as a Fresnel lens, is an acrylic sheet made up of an array of tiny lenses. This type of lens is far cheaper and lighter than glass.

Though it is still in its conceptual stage, the new design is "pretty well universal in application", Larsen says. But he admits its effectiveness is somewhat dimmed by clouds. The device is especially suited to weeds that choke crops grown in California's "winter veggie" belt.

The lens works as part of a three-pronged strategy of weed control. Weed seeds are

first germinated with a burst by irrigation, and are then withered with the solar weed killer, dragged through the rows of crops in a roughly north-south direction. A mechanical cultivator then turns over the soil to bury the weeds. Larsen uses his apparatus at noon, when the sun is at its highest, but future models may have mirrors to collect more of the sun's rays. One of the device's main benefits, Larsen says, is that it replaces potentially harmful herbicides. He believes that "pesticides which are put into the soil will be legislated out of existence".

The prototype device must be pulled very slowly over the weeds to give them a lethal blast of sunlight. Larsen is aiming to make the concentrator more powerful so that the concentrator and a cultivator can be hooked up together behind a tractor. Normal cultivating speed is 9 kilometres per hour. The technique may have trouble with plants such as nut grasses and morning glory which grow from underground shoots rather than from seeds.

(Article reprinted from *New Scientist* 13 June 1992)

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## IN BRIEF

### New Lab in France

Construction work has begun on a new biological control research laboratory at Montpellier, France. Funded by the CSIRO and a number of industry sources, the new facilities will house research teams investigating potential biological control agents for species from the region that have become pests in Australia. The new structures will replace outdated and crowded buildings.

### Giant Sensitive Plant

*Psigida salkeri*, a moth whose larvae feed on the leaves of the giant sensitive plant (*Mimosa invisa*), in its native Brazil, has been approved for entry into Australia for host-specificity testing. The trials will be

conducted at the Queensland Department of Lands' Alan Fletcher Research Station prior to possible release. It is hoped that the moth will prove effective under Australian conditions in controlling the giant sensitive plant. Although \$1.5 million a year is being spent on chemical control of the plant it is still spreading.

### DuPont Halts Work on Mariner Herbicide

After more than four years of studies and an undisclosed amount of money spent, E.I. du Pont de Nemours & Company has discontinued efforts to gain registration for the aquatic herbicide Mariner. Mariner contains the same active ingredient, bensulfuron methyl, as another registered herbicide, Londax. Londax is labelled for use on aquatic weeds in rice production.

Mariner was discovered to have a longer life in aquatic environments than Londax does in rice production environments. It also temporarily accumulated in freshwater clams, one of the monitoring organisms. The Environmental Protection Agency required additional studies on non-target organisms, specifically cattle feeding and poultry metabolism, trials. These studies would have cost several million dollars more. According to du Pont, the size of the aquatic herbicide market does not warrant the additional money required to label the product for aquatic use.

Researchers had high hopes for Mariner due to its growth regulation activity, especially the inhibition of tuber formation. Dr. Ken Langeland, who has conducted research on Mariner, expressed disappointment at du Pont's decision to discontinue the registration process. He feels strongly that the herbicide would have been a valuable hydrilla management tool. "This demonstrates the need to find avenues to register new products on a need basis rather than a strictly monetary basis. Aquatics is a small market compared to agriculture, which is the major reason for the lack of products labelled for

aquatic use." Support for these products might be gained through alternate sources of funding. Potential sources include public agencies since aquatic herbicides primarily are used for public benefit (as opposed to crops which are grown for profit).

### International Workshop Tackles *Mimosa pigra* Management

In Southeast Asia and Australia *mimosa* has spread to become an extremely serious weed affecting a wide range of natural environments. Awareness of the seriousness of the problem has increased through the 1980's. The International Workshop on *Mimosa pigra* Management was held in Darwin, Australia, May 10-15, 1992. The workshop was organized as part of a project on the control of *Mimosa pigra*, funded by the Australian Centre for International Agricultural Research (ACIAR), carried out by CSIRO Australia, Department of Primary Industry and Fisheries (DPIF), the National Biological Control Research Center (NBCRC) in Thailand and the Royal Irrigation Department in Thailand.

The Objectives of the Workshop were: 1) to give participants the opportunity to gain experience in the best methods of managing weeds; 2) to encourage participating countries to use effective strategies in *Mimosa* control. Research reports were presented by experts from Australia S-E Asia, and USA. No proceedings of the Workshop will be prepared, but instead a book has been published and distributed among the participants as the principal reference: "A guide to the Management of *Mimosa pigra*".

### 10th CAWSS & 14th APWSS Conference

The Conference is to be held in Brisbane 5-10 September 1993. The Second Circular has been set out. The deadline for Abstracts is 15 January and papers will be required by 1 May.

Member societies are asked to suggest speaker and topics for the CAWSS Oration by the end of January and for CAWSS medals by the end of April.

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## BOOKS

### Recommendations for Weed Control in Temperate Australia

The Weed Science Society of Victoria's publication, *Recommendations for Weed Control in Temperate Australia* Volume 1 has recently been published. It covers weed control in Aquatic, Forestry, Fruit, Industrial and Commercial, Lawn and Turf, Ornamental; Pasture Seed and Pasture situations, Additives and Soil Fumigants. Each of these situations is sub divided into sub-sections as per the chemical labels, i.e. for Fruit: Apples, Almonds, Grapes, Pears

etc. and the weeds of these sub-sections are listed in alphabetical order with the chemicals, rates and states registered and with critical comments given for each weed. Weeds of Temperate Australia refers to temperate weeds which are found growing in Southern Queensland, New South Wales, Victoria, Tasmania, South Australia and Western Australia.

The cost of Volume 1 is \$65.00. Postage is free in Victoria, \$10.00 all other states.

Volume 2 will be published in early 1993. This volume will cover weed control in Field and Vegetable crops and is organised in the same manner as Volume 1. A similar price!

For copies Ros Shepherd on (03) 7850105 or at the Keith Turnbull Research Institute, PO. Box 48, FRANKSTON Vic.

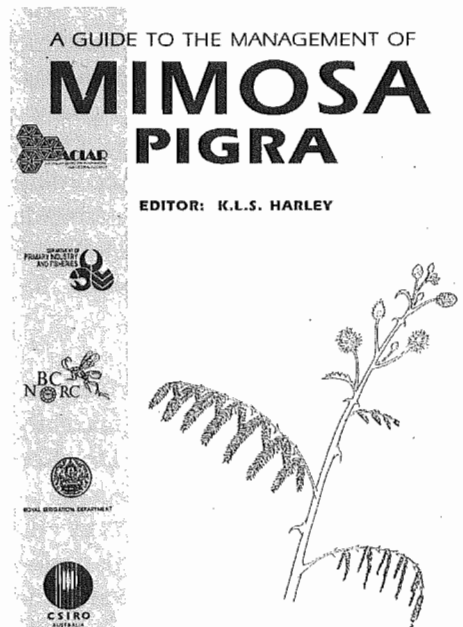
### Combatant's guide to the enemy

Harley, K.L.S. (ed.) 1992. *A guide to the management of Mimosa pigra*. Prepared for an international workshop held at Darwin, Australia, 11-15 May 1992. CSIRO Australia, 121 p.

Many years of research to develop control measures for *Mimosa pigra* have yielded a great deal of information useful for generating integrated management strategies. This manual was produced as workshop resource material, but it is also a useful guide to others confronted with *M. pigra* infestations.

The manual contains details of the plant's biology. It also provides information on the search for biological control agents and subsequent testing and monitoring of promising species. It also gives a comprehensive coverage of control with herbicides and other methods such as mechanical removal, and use of fire and competitive pastures. There are outlines for integrating the different methods to ensure best results from a multipronged attack.

CSIRO published the manual and ACIAR contributed towards costs of production. Queries about obtaining a copy should be directed to:



Dr I.W. Forno  
CSIRO Division of Entomology  
PMB 3, Indooroopilly  
Queensland 4068  
Australia

**Herbicides and Plant Physiology**

Andrew Cobb, \$41.95 (Chapman &amp; Hall)

This book aims to present to pure and applied scientists an up-to-date account of:

- the importance of weeds to crop losses,
- the discovery, development, and use of herbicides,
- the modes of action of the principal herbicide classes,
- the value of herbicides as probes to further our understanding of plant metabolism, and
- aspects of plant physiology that may provide potential targets for future herbicide development.

Four classes of herbicides are dealt with: herbicides that inhibit photosynthesis; auxin type herbicides; graminicides which inhibit lipid biosynthesis and those inhibiting amino acid biosynthesis. Each chapter deals with the structure of herbicides, mode of action, how treated plants die, selectivity, metabolism and

resistance, and contains comprehensive and up to date references. Ryegrass resistance to graminicides in Australia is discussed along with the rapid and widespread weed resistance to sulfonyl urea herbicides.

The author points out that inhibition of plant amino acid biosynthesis has become a major target of herbicide development since only plants and micro-organisms can synthesise all their amino acids. Consequently the chances of mammalian toxicity are slight. Important herbicides in this group are glyphosate (Roundup®), glufosinate (Basta®) the sulfonyl ureas such as Glean® and imidazolinones.

This book will be a valuable reference for students, researchers and of interest to educators particularly in the field of crop protection. Unfortunately the price may preclude as wide a general readership as it deserves.

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## DIARY OF CONFERENCES

*8-11 February, 1993*

**Weed Science Society of America.** Denver, Colorado. Contact: Mr R Schmidt, WSSA, 309 West Clarke St, Champaign Ill 61820. (217)356-3182.

*8-20 February, 1993*

**17th International Grasslands Congress.** New Zealand and Australia. Contact: Prof J Hodgson, Agronomy Department, Massey University, Palmerston North, New Zealand.

*7-8 June, 1993*

**International Symposium on Quantitative Approaches in Weed and Herbicide Research and Their Practical Application,** Braunschweig, Germany, Contact: EWRS-Symposium 1993, C/O Dr. Th. Eggers, Inst. f. Unkrautforschung, Biolog. Brundesanstalt, Messeweg 11/12, W-3300 Braunschweig, Germany. Ph: 49531399433; Fax: 49531399239

*23 August-3 September 1993*

**15th International Botanical Congress.** Tokyo, Japan. Contact: Kunio Iwatsuki, Department of Botany, Faculty of Science, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113, Japan.

*6-10th September, 1993*

**Combined XIV APWSS and 10th Australian Weeds Conference,** Brisbane.

Contact: John Swarbrick. Ph: 074 620281 Fax: 074 623081

*22-25, November, 1993*

**Brighton Crop Protection Conference:Weeds.** Brighton, UK. Contact: Conference Assoc & Services, 55 New Cavendish St, London W1M 7RE, UK. Fax. 071 935 7559.

*9-10, December, 1993*

**Herbicide Resistance Workshop.** Edmonton Canada. Contact: John Donavon phone (403)632-8208.

*4-9 July, 1994*

**8th International Congress of Pesticide Chemistry.** Washington DC, USA. Contact: Office of the Secretariat, American Chemical Society, 1155 16th St NW, Room 205, Washington, DC 20036, USA.

*21-27 August, 1994*

**24th International Horticultural Congress.** Kyoto, Japan. Contact: Japanese Society for Horticultural Science, Faculty of Agriculture, Kyoto University, Sakyo-ku; Kyoto 606, Japan.

**THE WEED SOCIETY OF NSW NEWSLETTER**

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**THE WEED SOCIETY OF NSW STATEMENT OF CASH FLOW**

30 SEP 1992

BALANCE AT JAN 31 1992 \$1532.08

INCOME DETAILS	DOLLARS	EXPENDITURE DETAILS	DOLLARS
Interest Cheque Ac.	53.11	Tax/Duty	8.28
Subscriptions	1718.00	Postage-newsletter	141.85
Seminar Registrations	117.0	Aust. Post - box	70.00
CAWSS Subsidy	1000.00	Dr. A. Watson	400.00
1987 Weeds Conf. Bal.	1277.69	A.G.I.S. Bulletin	571.53
AGM Seminar Regs.	285.00	Dr. J. Nalewaja	364.50
Dinner Receipts - 1991	105.00	Secretarial Exps.	408.00
		Macarthur Research Unit	164.95
		P. Kudsk	75.00
		Orange Field Day	587.76
		U.N.E. Weeds Prize	75.00
		CAWSS	90.00
		Deposit - Annual Dinner	300.00
		Bal.in Excess of Expend.	866.93
	4555.80		4555.80
Balance of Account	1532.08		
Plus	866.93		
Balance at 30 Sept.1992	2399.01		

**STATEMENT OF ASSETS SEP 30, 1992**

ASSETS	31/1/92	EXPLANATION	30/9/92
ANZ Term Deposit	3000.00	No Transactions	3293.20
A.B. Step Ah.	208.47	No Transactions	220.24
A.B. Term Deposit			
Chq. Ac.	20487.15	No Transactions	22326.12
	1532.08	As above	2399.01
Total	25227.70		28238.57