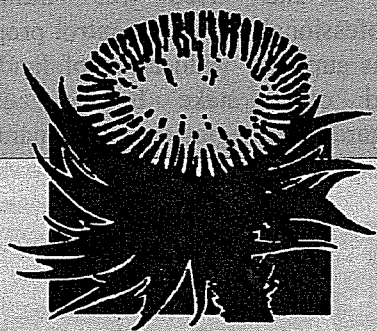


A Good Weed



the NEWSLETTER of
The Weed Society of New South Wales

3

SEPTEMBER 1995

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Searching for a Strategy

Strat'eg|y *n.* art of war, esp. (cf. *tactics*) the part of it concerned with the conduct of campaigns, choice of operations to be attempted, & getting of forces into favourable positions for attempting them. Given this definition, it was perhaps appropriate that delegates gathered at the NSW Police Academy, Goulburn, to search for a strategy to better tackle the state's worsening weed problems. This report from Mike Barrett highlights some of the issues which arose at that conference.

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....Searching for a Strategy

Leon Smith and I attended the Search Conference at the Police Academy, Goulburn, from the 4th to the 6th of August to develop the NSW Weed Strategy. A good representation of interested parties was assembled, which enabled some fresh approaches and ideas to be explored.



The main issues which were raised did reflect the need for change and an awareness of current problems. Some of these are outlined below.

The strategy to be adopted should address all weeds (noxious and others) and regard the management of weeds as part of land management. This is consistent with the revised Noxious Weeds legislation.

Integrated Weed Management in a regional context or on a catchment basis was essential. In this context, the research and particularly extension functions of the new CRC for Weed Management Systems will be of significance.

Community involvement in line with the Landcare movement, bushland regeneration groups and others was considered essential.

The need for training of professionals in weed control programmes was stressed. Education of land holders and other stake holders, especially regarding integrated weed management, was also recognised.

Three of the conference strategists, John Fisher (NSW Ag), Bob Paton (consultant) and Bob Sproule (NSW Ag) (l to r). ☐

A mission statement was agreed upon and reads:

"The strategy sets out the objectives and actions required to improve the effectiveness and co-ordination of activities by all stake holders to achieve a sustainable reduction in the effect of all weeds in the community."

The strategy document continues to be worked on.

Mike Barrett is a long-standing member on the Executive of the Weed Society. ☐

Weed Control and the EPA

This article by Jane Mallen-Cooper is one of two papers featured in this edition of *A Good Weed* which were given at the recent Weed Society seminar on Urban Weed Management.

The Noxious Weeds Act 1993 imposes responsibilities on both private landholders and public authorities for the control of weeds which have been declared noxious on land they occupy or manage. The use of herbicides to control noxious weeds is central to most weed control programs. Ideally, it forms part of an integrated range of techniques, implemented on a catchment basis.

In terms of environment protection, the application of herbicides, particularly in or near waters, requires special care and is affected by the provisions of the legislation administered by the Environmental Protection Authority (EPA). The Act, which has significant implications for the weed control industry, is the Clean Waters Act 1970 and its associated Regulations (Clean Waters Regulations 1972).

Section 16 (1) of the Clean Waters Act states that "a person shall not pollute any waters"! In this context, **waters** encompass anything from pristine lakes, rivers and swamps to drains. **Pollute** is defined as "to place in or on, or otherwise introduce into or on to, the waters (whether through an act or omission) any matter, whether solid, liquid or gaseous, so that the physical, chemical or biological conditions of the waters is changed", and **you are deemed to pollute** if you place any matter in a position where it "falls, descends, is washed, is blown or percolates ... into any waters".

Thus the direct application of herbicides to waters, or to adjacent lands

where they might "fall, descend, wash, blow or percolate" into waters, is pollution as defined by the Act.

Pollution as defined by the Act could also apply to the sedimentation of water courses as a result of mechanical removal of weeds, so it is important not to expose large areas of bare soil during weed control activities, and to implement some soil conservation measures to prevent large volumes of soil from washing into drainage lines.

The decision whether or not to apply for an EPA licence is at the discretion of the herbicide applicator. The Act does not make it an offence not to hold a licence; rather it is an offence to pollute unless authorised by a licence.

In fact, in the majority of situations, the EPA believes a licence is unnecessary, because contact of the herbicides with waters can be avoided by the exercise of "due diligence".

The Act does not make it an offence not to hold a licence; rather it is an offence to pollute unless authorised by a licence

Exercising "due diligence" involves the implementation of widely-understood and practical techniques such as:

only using herbicides which the container label states are registered for the particular weed species and location in question (e.g. diquat is registered for the control of salvinia in waterways);

applying herbicides strictly in accordance with directions on the registered label;

applying herbicides in accordance with "best management practices" as specified in the national

Guidelines for the Use of Herbicides In or Near Water (1985) or any other EPA-recognised guidelines or codes of practice;

ensuring herbicide users are fully trained in the proper use of herbicides (e.g. the Farm Chemical User Training Program);

ensuring that any observed impacts resulting from the use of herbicides are reported immediately to the EPA and dealt with quickly to minimise environmental harm; and

where practicable, co-ordinating weed control activities within catchments.

However, in some circumstances (for example the spraying of aquatic weeds, or weeds along river banks) the pollution of waters is unavoidable. Even if you follow all best management practices, you are going to pollute waters as defined in the Act.

In these cases, the EPA would recommend obtaining a licence, and these licences aim to minimise harm to the environment. Licences have conditions attached to them. These need to be followed in all weed control operations.

The EPA position on licensing is set out in the draft Licensing Guidelines on Herbicide Use In or Near Waters, released in January 1995. The draft guidelines are now being reviewed, taking into account the comments received from a wide range of stakeholders.

Your task as regenerators or managers of areas of urban and other bushland is a very important one, not only in conserving our biodiversity, but also in engendering environmental awareness among the community. However, your work in populated urban areas and other highly visited or sensitive sites means that you are often closely scrutinised, and thus it is very important that you implement well-planned programs, which include a consideration of relevant legal responsibilities.

Jane Mallen-Cooper works in the Waters and Catchments Policy Section of the NSW Environment Protection Authority, Locked Bag 1502, Bankstown NSW 2200. □

Biological Control as an Option for Bushland Weed Management

This article by John Hosking is the second featured from the seminar on Urban Weed Management.

Biological control of weeds involves the use of natural enemies to regulate the numbers of their hosts. Biological control aims at controlling host numbers - not eradicating the host.

There are two main types of weed biological control:

1. Inundative - organism applied in mass to achieve temporary control
2. Classical - exotic organism introduced to give continuing control

This seminar mainly covers the latter type of biological control.

Classical biological control mainly targets weeds which occur in dense stands on uncultivated land. In the past insects have been the main biocontrol agents. Now mites, plant pathogens and nematodes are also being used.

Why use biocontrol?

Classical biocontrol is a cheap form of long term control. In many cases it is the only economically viable form of weed control for rangelands and in some cases for suburbia. The main advantage of this form of control is that the target species, and in some cases closely related species, are the only plants damaged. One of the major disadvantages with biocontrol is the cost of introducing a new agent.

A Canadian estimate is that, for untried organisms, it takes about three scientist years to introduce each species. This time is reduced if the agent has already been used elsewhere.

Biological control programs rely on government funding and industry levies. Cost, quarantine space and time required to test agents are reasons why large numbers of weeds are not targeted for biological control at any one time.

How is it carried out?

Usually the weed is studied within its original range. The identities of the most damaging species of insects, mites, pathogens and nematodes associated with the weed are determined and their biology examined in detail.

Host specificity of potential biocontrol agents is checked against useful crop species, ornamentals and plants native to the country where the agents are to be introduced. Agents are then released if they prove to be sufficiently host specific.

In each program there should be monitoring of weed abundance prior to and following release of biocontrol agents. If this is not done the effect of the biocontrol agent is not known and

seasonal fluctuations in weed and biocontrol agent numbers are unknown.

In some cases, when weed numbers are high, further research may be initiated and chemical control carried out although the weed species is only at a temporary high. In such cases weed populations crash during the research program and money spent on the program and other forms of control is largely wasted.

Success rate for biocontrol programs

The most spectacular success involved the control of *Opuntia stricta* varieties by larvae of the moth, *Cactoblastis cactorum*.

Other successes have included the use of various insects to control other cactus species, water weeds and leguminous shrubs overseas. A rust (*Puccinia chondrillina*) has also been used to control one of the forms of skeleton weed (*Chondrilla juncea*) in Australia.

Classical biological control mainly targets weeds which occur in dense stands on uncultivated land

Many programs have been partially successful, including programs to control St John's wort (*Hypericum perforatum*) and lantana (*Lantana camara*). A number of programs have ceased without adequate control of the weed but some of these programs are recommencing, for example the program to control gorse (*Ulex europaeus*).

Programs involving control of bushland weeds

Over recent years there has been a push toward control of environmental weeds, particularly those occurring in native bushland. Australia is at present involved in programs targeting control of

broom (*Cytisus scoparius*), bitou bush and boneseed (*Chrysanthemoides monilifera* subspecies), bridal creeper (*Myrsiphyllum asparagoides*), other asparagus ferns (*Protasparagus* species), blackberry (*Rubus* spp.), groundsel bush (*Baccharis halimifolia*) and St John's wort.

Programs are also targeting a number of bushland weeds which are also rangeland weeds in tropical areas but I will not cover these. Overseas programs targeting control of bushland weeds include those for control of *Buddleja davidii* (New Zealand program) and those for control of various Australian species which are weedy in South Africa.

Future scope for control of bushland weeds

Most plants which are a problem could be targeted for biological control. However, each program is expensive and in many cases not justified as the weed can be controlled at a lower cost using either chemical or mechanical control.

Most biological control programs that have been carried out for a number of years have had some impact on their target weed but the impact may still be less than desired. Biological control should not be carried out where the aim is to eradicate the weed. Biological control agents are also unlikely to be

approved for release where they damage native species or where they damage species used for commercial purposes.

It is therefore less likely that classical biological control agents will be found for weeds which have close relatives in Australia (for example fireweeds, *Senecio* spp., although control of introduced *Rubus* species is an exception) or have some species which are weeds and others used commercially (for example various types of oats, *Avena* spp.).

Acknowledgements

Funding for various biological control programs conducted in New South Wales has been provided by the New South Wales Government through its Environmental Trusts, Australian and New Zealand Environment and Conservation Council, New South Wales National Parks and Wildlife Service, State Forests, Meat Research Corporation, International Wool Secretariat, Dairy Research and Development Corporation and Hunter Pastoral Company.

John is an entomologist with NSW Agriculture at the Tamworth Centre for Crop Improvement, RMB 944, Tamworth, NSW 2340. □

Cheap Chemical Imports ~ an Industry Perspective

In this article reprinted from the Newsletter of the Plant Protection Society of Western Australia (Volume 7, No. 2 1995), Peter Burgess gives an industry perspective on cheap chemical imports. Peter is Manager, Technical Services, SBS Rural IAMA.

The agricultural chemical market is ever changing. The recent importation of cheap chlorsulfuron adds another dimension to an already overcrowded and competitive industry.

Competition occurs at all levels. Multinationals compete against each

other in the race to develop molecules for the agricultural market. They maintain research, development, manufacturing and marketing infrastructure in order to provide products for the farmer.

The products come with quality standards and back up service.

Besides the large well known manufacturers, numerous other smaller generic manufacturers without a research and development base have entered the market place providing further competition.

The agricultural chemical industry is also implementing high standards of safety, in the storage, handling and distribution of Ag chemicals. There are many lobby groups ready to seize an opportunity to have agricultural chemicals banned.

The ability of individuals or groups to go to northern neighbour countries, and return with cheap off patent products, jeopardises the ability of the industry to maintain the current infrastructure in Australia.

Already one company has decided not to release a herbicide that kills *Emex australis* in lupins because cost recovery is unlikely before the product comes off patent. We are witnessing the amalgamation of multinationals, Hoechst-Schering (Agrevo), ICI-Incitec (Cropcare), and

Shell-Cyanamid (Cyanamid). The profitable part of these multinationals is certainly not agricultural chemicals.

A major concern is the drying up of the new molecule pipeline, particularly in view of the ever increasing incidence of ryegrass resistance and now some broadleaf weed resistance to chlorsulfuron and other herbicides.

A major concern is the drying up of the new molecule pipeline

As agricultural chemical profits are eroded we could be faced with multinationals pulling out of Australia rather than risk considerable resources bringing in new molecules only to have them copied and dumped on the market once off patent.

The pressure in turn will come to bear on the distribution network. With profits already squeezed it will become more difficult to justify the provision of agronomic and other associated services.

Any short term gains should be considered in light of longer term ramifications to the agricultural chemical industry in Australia. □

Weeds on the Net

By Hugh Frost
Dept of Plant Sciences
University of Oxford

database of the worlds invasive and weedy species - **Database of the Weeds of the World (Agricultural and Environmental)**.

The interest in this area within this Department stemmed from concern over the introduction of potentially invasive species of trees through our extensive network, but this interest also

A discussion group has been set up as a result of a six month project to examine the feasibility/desirability of establishing a

overlapped with an international group concerned with monitoring the effects of climate change. It was felt that invasive and weedy species might make very good candidates for evaluating changes in vegetation structure associated with climate change.

Subsequently, a number of other agencies have expressed interest (notably agronomists and the conservation lobby). Workers in the UK, USA, New Zealand, South Africa and Australia have been canvassed for their views through a series of meetings and there is obvious concern for the issue of invasives in all of these countries.

It was felt that invasive and weedy species might make very good candidates for evaluating changes in vegetation structure associated with climate change

There has been little attempt to assess the threat of species outside of the given territory, given internal financial and administrative constraints. Technical limitations are also not insignificant given the global nature of the problem.

One model examined to date has been the database used in Holm *et al.* (Geographical Atlas of the Worlds Worst Weeds). Technically, it is not difficult to put these data into an electronically searchable format. It could be a useful spine of information on taxonomy and distribution which could be supplemented and subsequently refined.

The purpose of this discussion group is to elicit responses to the broad concept of a global database on invasive plants and to seek suggestions on how such a project might proceed in terms of the information required and how it might be distributed. It is hoped that funding may be found to carry this work further.

Subscribing to the conference

If at any time you or a colleague wishes to receive and participate in the discussion then send a one line message:

subscribe WWD-L
to the email address
maiser@plants.ox.ac.uk

You will then begin to receive the discussion. If you have a contribution to the discussion you should send your contribution to:

WWD-L@plants.ox.ac.uk

All other members of the list will then receive a copy of your message. You will also receive a copy of your own message so you know it has been received by the mail server computer.

Removing yourself from the discussion

If at any time you wish to withdraw from the discussion and stop receiving messages relating to this topic then send a one line message:

unsubscribe WWD-L
to the email address
maiser@plants.ox.ac.uk

You may resubscribe yourself at any time. Any problems relating to subscribing or unsubscribing to the list should be sent to the email address:

nick.waltham@plants.ox.ac.uk

(Further information about this discussion group can be obtained from: Mr Hugh Frost, Dept Plant Sciences, University of Oxford, South Parks Road, Oxford OX1 3RB UK, Tel: -01865-275021, Fax: -01865-275146. Reprinted from Australian Weed News, Vol 2 Issue 2, June 1995.) □

Weeds Unit Moves to Tamworth

By Tony Cook
Tamworth

On 3 July 1995 NSW Agriculture's Northern Weeds Research and Demonstration Unit began operations at Tamworth's Centre for Crop Improvement (TCCI).

The northern unit was initially started at Glen Innes Agricultural Research and Advisory Station in 1982. Max McMillan (Weeds Agronomist) and Neville Strachan (Technical Officer) were the initial members of the Unit. Tony Cook replaced Neville in 1989 and Max resigned in mid 1993 to leave a disjointed weeds unit.

A replacement for Max was of high priority for NSW Agriculture. As a result, Andrew Storrie, former District Agronomist (Griffith), was appointed as Weeds Agronomist in January 1995. He was located at TCCI for approximately 5 months representing the 'unit' by himself until Tony obtained a transfer in July.

Now the Northern Weeds Research and Demonstration Unit can begin normal functions, that is to demonstrate to District Agronomists, Weed Officers and farmers quick answers to weed problems that do not require in-depth research. Other specialised knowledge with which the unit has experience includes the herbicide resistance campaign (northern NSW has a few herbicide resistance problems already). Demonstration work and field days will be aimed at increasing the awareness of this problem.

Previous work by the unit pioneered and investigated the long term control of wild oats (*Avena* spp.) in

wheat using selective grass herbicides sprayed at the jointing stage to prevent seedset and thus prevent the perpetuation of the population. This new technology is referred to as 'crop topping' and occasionally known as 'selective spray-topping'. Results are extremely promising as initial populations of approximately 630 plants per m² have been reduced to 5.8 plants per m² after three years of continuous cropping - a reduction of more than 99%!

Tony Cook (here and over page) at work applying herbicides to tea trees in a collaborative trial with the University of New England near Guyra on the Northern Tablelands of NSW. ☺



Extensive work was also completed by the unit which involved herbicide screening for potential

herbicide treatments for use in the oil tea tree industry. A total of 18 herbicide treatments were recommended by the unit as safe, cheap and effective weed control options. All these treatments are covered by either Pesticide Orders or label registrations.



The herbicide recommendations encompassed all types of use patterns, from pre-plant pre-emergence through to post-harvest applications. A weed control/identification booklet will be published late this year to help aid growers combat their weed problems.

Andrew Storrle can be contacted on (067) 631174 and correspondence should be directed to: NSW Agriculture, Tamworth Centre for Crop Improvement, Calala Lane TAMWORTH NSW 2340. □

Permits to Possess Noxious Weed Material

NSW Agriculture officers and Local Government weeds inspectors have a requirement from time-to-time to display noxious weeds at field days and other venues to promote public awareness of

the noxious weed problem. This practice needs to be sanctioned under the Noxious Weeds Act 1993.

Section 34(1) of the Noxious Weeds Act states that the Minister may permit a person or body to have, transport or grow a noxious weed for the purposes of research or other purpose specified by the Minister.

After consultation with the Department's legal staff, two versions of a Section 34(1) permit are now ready for release.

Noxious Weed Permit A

Entitles the holder or holder's agent to possess noxious weed material for the purposes of research, education or public awareness (Section 34, Noxious Weeds Act 1993) until the permit is cancelled by the Minister or his/her delegate.

The holder or the holder's agent must be authorised under Section 41 or Section 42 of the Noxious Weeds Act 1993.

Noxious Weed Permit B

Entitles the holder to possess one species of a specified noxious weed for the purposes of research, education or public awareness (Section 34, Noxious Weeds Act 1993) for a specified time period.

Persons requiring a Section 34 permit should apply to:

Program Leader (Weeds), Division of Plant Industries, NSW Agriculture, Locked Bag 21, ORANGE NSW 2800, Phone (063) 91 3159, Fax (063) 91 3206

Annual Dinner



The Annual Dinner of the Weed Society will be held in the Elizabeth Room at the North Sydney Anzac Memorial Club, Cammeray on Thursday, November 23rd

at 7 for 7.30 pm. The cost is approximately \$30 per head. Wine and beer will be provided on the table. Parking is available on the site.

Please advise Robert Plumbe (02) 484 0308 (phone and fax) by Friday 18th November if you will be attending the Annual Dinner.

Your AGM is Here

The 30th Annual General Meeting of The Weed Society of New South Wales Incorporated will be held on Wednesday, November 29, 1995 at Augustin Wines and Vineyard, Mudgee, commencing at 10 am. All Society members are invited to attend. The winery is 7 km from Mudgee (follow Cassilis Road and turn onto George Campbell Drive near the Airport).

As well as usual business, office bearers for 1996 will be elected; the president will give an address on Field Results with Adjuvants on Brush Weeds; and the motion will be put that 'the constitution as circulated be approved'.

Lunch will follow the AGM from 12 until 1.30 pm at Augustin Wines



and Vineyard.

The afternoon program consists of a field day on the control of silver-leaf nightshade (*Solanum elaeagnifolium*) which is jointly sponsored by NSW Agriculture and the Weed Society. This will take place at 2 pm on the property 'Cumbandry' between Mudgee and Gulgong on Home Rule Road. There will be signs on the road.

Please advise Leon Smith by Thursday, November 23 on (047) 393 564 (phone or fax) if you will or won't be attending the AGM and field day at Mudgee.

Letters to the Editor

Dear Editor

In your report on the International Compositae Conference (A Good Weed, No 2, June 1995), you asked what "ethnopharmacognosy" is. Basically, it is concerned with the traditional knowledge and customs of people groups who use plants as drugs and/or medicines in a relatively natural or unprepared state. The subject is introduced in two recent Australian texts:

Cartwright, L. 1985. *A commonsense guide to medicinal plants*. Angus & Robertson, North Ryde.

Lassak, E. and McCarthy, T. 1983. *Australian medicinal plants*. Methuen, North Ryde.

Many of the relevant plants are those which we call 'weeds'.

Jim Longworth
2 The Boulevard
Cheltenham 2119

Announcement

Consumer Affairs
Associations Incorporation Act 1984
Registered No. :Y221345

Certificate of incorporation of Association

This is to certify that
The Weed Society Of New South Wales Incorporated
is on and from the twelfth day of September 1995 incorporated under the Associations Incorporation's Act 1984.

Issued by the Department of Consumer Affairs and given under my hand this twelfth day of September 1995.

Director, Consumer Affairs.

Members Matter

We welcome a number of new members who have joined the society since August this year. We look forward to your contributions to the society and we welcome your suggestions. The new members are:

Sue Boschma of the University of New England, Armidale;

Graham Charles of NSW Agriculture, Narrabri;

Tony Cook of NSW Agriculture, Tamworth;

Elizabeth Davidson of the University of New England, Armidale;

Matthew Jones of Sutherland;

David Murray of Gwynnerville;

Ian Radford of Balmain; and

Gordon White of the University of New England, Armidale.

Scholarships in Weed Science

University of New England

*Ecology and Management of *Polymeria longifolia* in Cotton*

A scholarship funded by the Cotton Research and Development Corporation is being offered for a student to conduct research leading to a PhD on the subject of the Ecology and Management of the 'Take-all' Weed, *Polymeria longifolia* (Peak Downs curse), in Cotton.

Unlike many weeds of cotton, the incidence of Peak Downs curse, a native Australian plant, appears to be increasing under current reduced-tillage management systems.

It belongs to the 'take-all' group of weeds, named so because of their perennial, rhizomatous habit and ability to smother the ground and 'take-all' of the nutrient and water resources available in the soil. Although ranked as one of the 10 major weeds of cotton,

virtually nothing is known about its ecology or how best to control it.

The research will involve surveying the distribution and spread of Peak Downs curse, establishing its relationship to crop management practices, soil types and seasonal conditions; quantifying the competitive impact of Peak Downs curse on cotton; examining its ecology; and elucidating the principles for its effective management.

The student will be based at the University of New England (UNE), Armidale, NSW, but will collaborate with researchers from the CRC for Sustainable Cotton Production at Myall Vale near Narrabri. UNE is also a partner in the new CRC for Weed Management Systems.

The successful applicant will receive an annual stipend of \$20,110 (tax exempt) and funds to conduct the research totalling approximately \$18,000 per annum.

Integrated Weed Management in Chickpeas

A scholarship funded by the Grains Research and Development Corporation is being offered for a student to conduct research leading to a PhD on the subject of Integrated Weed Management in Chickpeas.

The project is part of a major collaborative research program aimed at developing and promoting integrated weed management systems for the grain industry in northern NSW and southern Queensland.

Chickpeas are increasingly being used in rotations with wheat to enhance soil nitrogen and break graminaceous disease cycles. One of the major agronomic constraints to sustainable and economic production, however, is the difficulty in controlling weeds.

Chickpea has an extremely slow initial growth rate and so is a poor competitor. Yield losses of up to 90% can occur in weedy situations. There is currently no effective post emergence herbicide registered for broadleaf weed control. Registered pre emergence

herbicides are expensive, and there are problems with residues affecting chickpea yields.

This project will involve quantifying the impact of weeds on chickpea yields, defining the 'critical period of weed interference', and developing integrated and sustainable weed management techniques in which the competitive ability of chickpeas is increased and the dependence on herbicides is reduced.

The student will collaborate with researchers from NSW Agriculture and the Queensland Department of Primary Industry.

The successful applicant will receive an annual stipend of \$20,000 (tax exempt) and funds to conduct the research totalling approximately \$12,000 per annum.

Applicants for either of these scholarships should have a good honours degree in Agricultural Science, Rural Science or Science, though inquiries from people with industry experience are also welcome. The scholarships are available as from 1 January 1996 and will last for 3 years. For further information, please contact:

Dr Brian Sindel, Lecturer in Weed Science, Dept of Agronomy & Soil Science, and CRC for Weed Management Systems, University of New England, Armidale NSW 2351, Telephone: (067) 73 3747, Fax: (067) 73 3238, Email: bsindel@metz.une.edu.au

CRC for Weed Management Systems - Postgraduate and Honours Scholarships

The CRC for Weed Management Systems is offering a limited number of postgraduate and Honours scholarships as part of its Education Program.

Students may study a wide range of topics in weed management, including biological control, integrated weed management in cropping systems,

herbicide technology and resistance management, weed ecology and population dynamics, rehabilitation of natural ecosystems, and economics and decision support.

PhD scholarships will be to a maximum of \$19,307 pa. Honours scholarships will include a \$2,000 scholarship to the student and \$2,000 in research support to the host institution.

Preference in allocation of scholarships will be to students working with organisations participating in the CRC, including: NSW Agriculture, CSIRO Divisions of Entomology and Plant Industry, Keith Turnbull Research Institute, WA Department of Agriculture, and the Universities of Adelaide, New England, and Charles Sturt.

For information, write to: Dr Rick Roush, CRC for Weed Management Systems, Waite Campus, Glen Osmond, SA 5064, FAX: (08) 379-7125. email: rroush@waite.adelaide.edu.au



Other Good 'Reads'

Handbook of Weed Management Systems

Edited by Albert E. Smith, University of Georgia, Griffin, July, 1995/760 pages, illustrated/\$195 US.

This unique reference - *the first book of its kind on the subject* - presents the fundamental information necessary for the development of weed management strategies for all of the major US crops using concepts that can be applied worldwide.

It covers weed management systems for cotton, peanut, soybean, wheat, barley, oat, sorghum, rice, fruits, nut crops and more! It has over 1550 bibliographic citations, tables, drawings,

and photographs. *Handbook of Weed Management Systems* is an excellent resource for weed, crop, soil, plant, animal and environmental scientists; fertiliser and pest management specialists; plant physiologists; horticulturists; agriculturalists; agronomists; botanists; foresters; and upper-level undergraduate and graduate students in these disciplines.

Contents: Introduction, Ecology of Weeds, Preventive Weed Management, Mechanical Weed Management, Chemical Weed Management, Herbicide Application Equipment, Herbicide Formulations, Adjuvants and Spray Drift Management, Fate of Herbicides in the Environment, Biological Weed Management, Weed Management Systems for Oil Seed Crops, Weed Management Systems for Grain Crops, Weed Management Systems for Pastures and Hay, Weed Management Systems for Rangeland, Weed Management Systems for Horticultural Crops, Weed Management Systems for Turfgrass, Weed Management Systems for Forest Nurseries and Woodlands, Herbicide Index, Weed Index, and Crop Index.

ISBN: 0-8247-9547-4

Marcel Dekker, Inc., Promotion Department, 270 Madison Avenue, New York, NY 10016 • (212) 696-9000

Biological Control of Weeds and Plant Diseases - Advances in Applied Allelopathy

By Elroy L. Rice. This is a timely study by a world-renowned authority of the production by plant and microorganisms, of compounds that affect the growth, health and population biology of other plants and microorganisms. Elroy L. Rice focuses on new developments in allelopathy in agriculture and forestry, where the deleterious side effects of synthetic pesticides necessitate more widespread use of biological control techniques.

Summarising the explosion of knowledge during the last decade in Germany, Belgium, Scandinavia, the Netherlands, Pakistan, India, Australia, Russia and Canada, as well as the United States, Rice adds his own insights to the various topics reviewed. He tells how, in many cases, biological control can be substituted for chemical control with no decrease in crop yields, and how, in other cases, only a minimum of research remains to be done before the data are conclusive.

This insightful review of the most recent work in a critical scientific field should become a standard reference for plant pathologists, agronomists, foresters, horticulturalists and scientists in allelopathy - for anyone interested in biological control of weeds and plant diseases.

LC: 94-23242. 448 pages, 14 figures, 19 tables, bibliography, index. ISBN: 0-8061-2698-1 Cloth \$55 US.

Send order to: University of Okalahoma Press, P.O. Box 787, Norman, Okalahoma 73019-0445. Or call 1-800-627-7377.

Turf Weeds and their Control

A.J. Turgeon, editor. Published by the Crop Science Society of America and American Society of Agronomy. Hardcover, 248 pages, 1994. ISBN 0-891180-120-2. Price \$60 US.

Controlling weeds in turf may include virtually any practice designed to prevent weed emergence or to effect shifts toward desirable turf and away from undesirable vegetation. Historically, turf weed control has been heavily dependent upon properly establishing turf and creating an environment conducive to healthy, vigorous growth. The increased use of turf, the development of new chemistries and techniques for herbicide application, and the growing concern over pesticides and their environmental impact led to the publication of *Turf Weeds and their Control*.

Herbicides may be used to control existing weed populations or to enhance the turf's resistance to weed invasion. Because of the role that herbicides often play in turf weed control, several chapters in the book emphasise herbicide action and metabolism, formulations, application methods and practical uses. Since some herbicides may cause injury, reduced growth, or loss of competitive capacity of selected turf, a chapter devoted exclusively to this subject was included. A chapter on the environmental fate of herbicides is also included. Because weed management usually involves a combination of chemical and cultural methods, chapters are included that focus on weed taxonomy, ecology and control. This constitutes the foundation on which a turf weed control program should be built.

Send your order to: CSSA, ASA Headquarters Office; Attn: Book Order Department, 677 South Segoe Road, Madison, Wisconsin 53711-01086, USA. Fax your order to 697-273-2021.

Upcoming Events

Sixteenth Asian-Pacific Weed Science Society Conference

The Organising Committee takes pleasure to invite eminent weed scientists to present their papers at the 16th Asian Pacific Weed Science Society Conference in September, 1997 at Kuala Lumpur.

This conference has become a prominent arena for weed researchers for the Asia Pacific region and the world in general to meet once every two years. The conference, which will be held over five days, is expected to deliberate on pertinent issues in weed science such as: optimal inputs for sustainable agriculture, maximisation of yield and quality of food and fibres; increased labour efficiency in weed management;

judicious use of herbicides and environmental conservation.

The conference will include a keynote address, one plenary lecture on each day followed by concurrent sessions. Oral and poster sessions will cover a broad range of topics of interest, including:

- biological control
- weed management
- extension, education and training
- environmental conservation
- herbicide application technology
- herbicide resistance
- novel herbicides
- regulatory legislation and quarantine
- weed biology and ecology

Prospective contributors of papers for oral or poster presentation can write to the organising secretary at the address below. The organisers will publish full papers of both oral and poster presentations.

All enquires and correspondence should be addressed to: Dr. Baki Hj. Bakar, Organising Secretary, The 16th APWSS Conference, 1997, C/- Botany Department, University of Malaya, 59100 Kuala Lumpur. Tel: 603-7594351, Fax: 603-7594178, Email: baki@botany.um.edu.my



11th Australian Weeds Conference Update

The brochure about the 11th Australian Weeds Conference is now ready and will only be mailed to those who have already expressed interest.

Anyone wanting a copy of the second circular should write to the Weeds Society of Victoria, PO Box 987, Frankston, Vic. 3199.



A Good Weed

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