NEWSLETTER

Number 4 September, 1993

oooOOOooo

THE WEED SOCIETY
OF NEW SOUTH WALES

IN BRIEF

Paul Weiss Awarded Churchill Fellowship

Paul has been awarded the Fellowship to study the ecology and control of woody weeds and rehabilitation of invaded areas. Next year he will go to South Africa to study bitou bush and then to the CSIRO biological control Unit at Montpellier in France. In addition he will study mesquite in Texas, Arizona and New Mexico, USA.

Currently, Paul is lecturing in horticulture at Canberra Institute of Technology. He is still involved in the biological control of bitou bush on the NSW coast.

Harry Combellack IWSS Award

Harry Combellack was awarded the IWSS Outstanding Achievement Award for 1993. Chester McWorter also received an Award.

Roger Cousens Goes West

Roger is currently president of our society. He has accepted the position of Leader of the WA Weeds Group, recently vacated by Bob Martin.

Roger has been Senior Lecturer in Weed Science at Sydney University for the last 5 years.

His initiatives to enliven this society will be missed. Good luck Roger!

Weeds Conference a Success

The Combined APWSS/CAWSS conference held in September at Brisbane was attended by 450 people from Asia and Australia.

Volume 1 of the Proceedings of the Conference are available from the Organisers for $55. Volume 2 will be available shortly.

Recipients of 1993 Travel Awards

Three Awards were given this year for members to attend the APWSS/CAWSS, to Peter Michael, Mike Barrett and Chris Nazer. The Awards covered the costs of registration and the proceedings ($450).

Reviews of Weed Science

At the recent WSSA Board meeting in Denver, Dr Malcolm Devine was appointed Editor of Reviews of Weed Science for a 3 year term, replacing Dr Stephen O Duke. Dr Devine has now taken over the handling of all manuscripts. From now on, the Editorial Board will no longer accept unsolicited proposals for reviews submitted directly by the authors. However, suggestions for topics (including authors) will be considered. Please address all correspondence and enquires concerning Reviews of Weed Science to: Dr Malcolm Devine, Department of Crop Science and Plant Ecology, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N OWO. Tel: 306/966-4947. Fax: 306/966-5015. E-mail devine@sask.usask.ca.

oooOOOooo

NEW PRODUCTS

Sertin® Plus

A new formulation of sethoxydim will be marketed alongside Sertin 186 EC. Sertin Plus differs from Sertin 186 in the following ways:

- (pre) formulated with adjuvant package (surfactant A)
- superior efficacy on a range of grass weeds has allowed: a lower minimum rate of sethoxydim per hectare, to be recommended for control of wild oats and ryegrass
- 120 grams per litre as compared to 186.

Spinnaker TM

Formulated at 240 g/L of imazethapyr. An "imidazolinone" herbicide, it is registered or has permits covering its use in the following crops at either pre or post-emergence application (see label). When used post-emergence, wetting agent is added at a rate of 200 ml BS1000/100L water (or a similar non-ionic wetter). Field peas, faba beans, lucerne, soybeans, peanuts, mung beans, sub-clover. Some varietal restrictions apply. Further information can be obtained from John Cameron, phone 02-3178627.

Du Pont Products Reviewed

Following their announcement to pack metsulfuron (Brushoff®) in 40 gram packs and broaden the label recommendations for both Brushoff® and Ally®, Du Pont have announced a further packaging change, this time for Glean®. A new water soluble "Toss-N-Grow" pack comprising 5 x 100 gram water soluble sachets of Glean® is now available. The packs dissolve when added to the spray tank.

New DowElanco Products

Broadstrike® is a water dispersible granule, for early post-emergence control of broadleaf weeds including amsinkia, mustard and wild radish in field peas, wheat and pasture legumes. Rate of use is 20-25 g/ha.

Eclipse® is a water dispersible granule, for early post-emergence control of broadleaf weeds including amsinkia, mustard, wild radish and spiny emex in cereals and lupins. Rates of use are 5-7 g/ha.

Both herbicides are sulfonamides and have the same mode of action as the sulfonylureas.

Achieve WG®

The new formulation of tralkoxydim from ICI for post-emergence control of wild oats, annual ryegrass and annual phalaris in wheat, barley, cereal rye and triticale. The active ingredient is formulated as a wettable granule (250 g is equivalent to 1 L Grasp®).

oooOOOooo

FEATURES

Current Research on Fireweed

By Roger Cousens
(ex) University of Sydney

Senecio madagascariensis is without doubt one of the worst weeds of coastal N.S.W. pastures. Its current range also extends into southern Queensland, although bioclimatic predictions suggest that it could eventually spread to much of Victoria as well. Its southern limit currently is in the Bega shire. Occasional plants are found west of the Divide, but to date the only population established away from the coast is at the Western Plains Zoo, Dubbo. The species is currently declared noxious in 12 shires. We have good short-term chemical control measures, especially bromoxynil. Many farmers use slashing as their only means of control, but its benefits are questionable.

Biological control is seen as the most likely long-term control strategy, and most current research is directed towards that. The Meat Research Corporation has been funding entomological collections and research, based at the Alan Fletcher Research Station, Queensland. AMP and Lady Elizabeth MacArthur-Onslow have also contributed to their work, as has the Queensland Department of Lands. The Dairy Research & Development Corporation is funding a study of the economic effects of fireweed and the likely ecological impacts of the introduction of biological control agents (particularly bearing in mind possible effects on native relatives of fireweed). This work is being done at Sydney University and NSW Agriculture, Tamworth; both organisations

are providing additional support from their own funds. NSW Agriculture also continues to work on the management of pastures to minimise the impact of fireweed, through their core research programs and through the work of their District Agronomists. Herbicides for some of the work have been generously supplied by Incitec and Rhone-Poulenc.

In this article, all of the major workers involved in the biological control effort review their progress to date. It should be emphasised, however, that much of this research is still in its early stages. As a result of the research, we will end up with sufficient data for the decision on release of biocontrol agents to be based on facts rather than on the prejudices of biocontrol proponents or conservation authorities.

Potential Agents for Biological Control of Fireweed (Graham White, Jennifer Marohasy and David Sparks, Alan Fletcher Research Station)

Classical biological control involves surveying in the country of origin of the weed for damaging insect or disease agents, testing to ensure that the agents do not attack commercial or Australian native plants, and, if approval is granted by the relevant government agencies, mass rearing and release into the field.

Fireweed is thought to be native to Madagascar and South Africa. Brief surveys in both countries found 14 and 17 species of insects, respectively, feeding on fireweed. Two of the most damaging species from each country were chosen for import under quarantine into Australia as potential biological control agents. The two South African insects, a flower-feeding Pyralid moth, *Homeosoma stenotea*, and a stem-boring Agromyzid fly, *Melanagromyza* sp., will be imported to Australia during September/October 1993 for testing.

Host testing of two Madagascan moths under quarantine at the Alan Fletcher Research Station is almost complete. A flower-head feeding Pyralid, *Phycitodes* sp., died out in culture after it was found to attack a range of plants in the family Asteraceae in standard cage tests. A tip- and stem-boring Tortricid, *Lobesia* sp., was also found to attack a range of plants related to fireweed in the standard small cage tests. However in large cages which do not confine the moths and volatile chemicals from fireweed so closely around other test plants, the host range of *Lobesia* sp. is restricted to two sub-species of the Australian *S. lautus* complex. This is believed to be a better indicator of the likely host range in the field.

Fireweed grows in part of the range of *S. lautus* (see below), one of the native plants attacked by *Lobesia* sp. in quarantine. Release of *Lobesia* sp., and perhaps the South African insects, may depend on the approval by conservation authorities for release of an insect likely to feed on native plants as well as the introduced weed.

Studies in Australia on Existing Pests of *Senecio madagascariensis* and the *Senecio lautus* complex (Royce Holtkamp and John Hosking, NSW Agriculture, Tamworth)

Australian field studies are currently under way to determine the insects and diseases found on *Senecio madagascariensis* and the *Senecio lautus* complex in an effort to determine whether naturally occurring agents discriminate between these species. Most insects and diseases which occur on *S. madagascariensis* also occur on *S. lautus*. In excess of 90 species of insects and two rusts have been recorded on these two *Senecio* spp. to date.

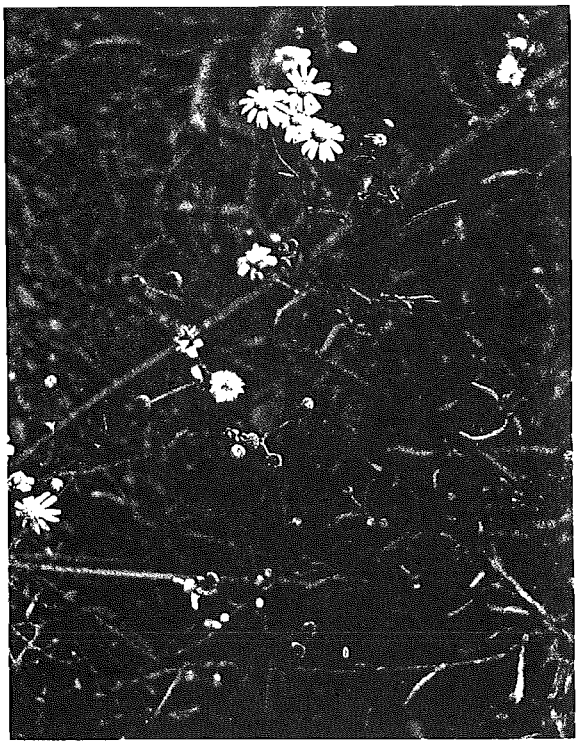
The most common insects include a leaf feeding beetle, *Chalcolampra* sp. (Coleoptera: Chrysomelidae); two moths, the leaf feeding magpie moth, *Nyctemera amica* (White) (Lepidoptera: Arctiidae) and the blue stem borer, *Patagoniodes farinaria* (Turner) (Lepidoptera: Pyralidae), and two seed head

Senecio madagascariensis Poiret fireweed

Origin A native of South Africa.

Description An annual herb closely resembling *S. lautus* (opposite) in appearance, previously regarded as part of the *S. lautus* complex. *S. madagascariensis* is characterised by a fairly constant number of bracts (phyllaries) (20–21) surrounding the flower heads and a constant number of ray florets (13) in its flower heads. Its 'seeds' are 1.5–2.5 mm long with short hairs in longitudinal lines. Similar species in the *S. lautus* complex have densely hairy 'seeds' and fewer phyllaries.

Distribution and Importance *S. madagascariensis* occurs in NSW on the coast and the northern tablelands and in the central west. First recorded from the lower Hunter Valley in 1918, the weed now heavily infests pastures and native vegetation and is especially prevalent following a drought. Death and ill-thrift among livestock grazing infested pastures is attributed to the presence of pyrrolizidine alkaloids.



Senecio madagascariensis x 0.4

Senecio lautus G Forster ex Willd s lat fireweed
variable groundsel

Origin Natives of Australia.

Description A complex of subspecies. Erect herbs, sparsely hairy with variable leaf shape. Flower heads yellow, in a terminal panicle, each head surrounded by bracts having narrow brownish tips, papery margins and covered with very short white hairs. **'Seeds' usually densely hairy.**

Distribution and Importance *S. lautus* occurs in all States, especially in coastal areas, although some subspecies occur at high altitudes in south-eastern Australia and others in arid central Australia. Commonly found in unimproved pastures and woodland, roadsides and wasteland. See also *S. madagascariensis* (opposite).

Senecio lautus x 0.2 120379

feeding bugs, *Nysius clevelandensis* Evans and *Nysius vinitor* Bergroth (Hemiptera: Lygaeidae). A stem mining fly, *Melanagromyza seneciophila* Spencer (Diptera:Agromyzidae); a leaf mining fly, *Chromatomyia syngenesiae* (Hardy) (Diptera: Agromyzidae) and two species of gall-forming flies, *Sphenella ruficeps* (Macquart) (Diptera:Tephritidae) which forms galls in flower heads and *Trupanea* sp. (Diptera: Tephritidae) which forms galls in stems and flower heads, are also commonly found. The larvae of *Chalcolampra* sp. and *N. amica* can cause significant defoliation of *Senecio* spp. Larvae of *P. farinaria* ringbark stems and may kill many plants. The two rusts found are *Puccinia lagenophorae* Cooke and *Albugo tragopogonis* (DC.) S. F. Gray.

Most of these insects appear to be specific to *Senecio* spp. although generalist feeders such as some Lepidoptera, the *Nysius* spp. and the leaf mining fly, *C. syngenesiae*, were also found. *C. syngenesiae* feeds mainly on Asteraceae while the others mentioned feed on a wide range of species in a number of families. In excess of 50 species of Hymenoptera have also been found so far during this study. Their role is unclear at present. Many of these are probably parasitoids of other insects found although some could be gall formers.

The taxonomic similarity between *S. madagascariensis* and the *S. lautus* complex is paralleled by the similarity in insect and disease species occurring on these plants.

Ecological Studies on Senecio madagascariensis and Senecio lautus (Ian Radford, University of Sydney)

A comparative study is under way on fireweed (*Senecio madagascariensis*) and the closely related native *Senecio lautus* to provide background ecological information to predict the impact of a biological control agent on the two species. The information being gathered incudes an Australia-wide compilation of distribution data, a comparison of genetic/morphological diversity in N.S.W., seed production and longevity estimates, and field observations of phenology/ecology at 10 permanent sites visited monthly. These studies are well under way and some results are at hand.

Senecio lautus is a much more widespread and genetically diverse species than *S. madagascariensis* in Australia (though it seems that the latter is quite variable in its homeland), but is also much more patchy in its distribution. Within its Australian range fireweed can be found in almost every pasture and on every road verge, while within its range *S. lautus* with its more "specialised" habitat types, will often be found in disjunct populations such as scattered alpine and subalpine patches of the N.S.W. tablelands, scattered dry rocky ridges on the Western Slopes, and exposed headlands and sand dunes on the coast. Morphologically fireweed is relatively uniform throughout its Australian range while *S. lautus* has more than 7 recognisable ecotypes (only 4 of which are taxonomically described as subspecies) within which there are even more complex patterns of variation. This variation is maintained even in uniform glasshouse conditions indicating that the variation is genetically based and not a reflection of developmental plasticity.

The ecology of the two species is quite similar. Both thrive in relatively non-competitive situations. *S. lautus* thrives in rocky, shallow soil habitats where there is little ground cover; in patches between alpine herbs and grasses; in sand dunes at the seaward edge of encroaching heath vegetation or on recently flooded river banks. Fireweed is most abundant where there has been drought or overgrazing leaving bare patches for it to establish. Once established, however, it appears to compete well with pasture. Populations studied have been seasonal in their flowering/fruiting periods, dying back completely and relying on the seed bank for regeneration, or as plants in a relatively dormant state in less severe conditions. Both species avoid the worst

extremes of summer and frosty winters in this way. In ideal conditions, however, both species appear to be capable of flowering all year round. This flexibility of life history enables these species to act as annuals in most extreme climates or as biennials or short lived perennials in more benign conditions.

Preliminary work on seed storage suggests that *S. lautus* seed is longer lived than that of fireweed. Over a 7 month period we observed that viability in *S. lautus* seeds went down from about 70 to 40 percent while similar aged fireweed seeds went from 70 to 20 percent. This is being further investigated in the field by burying seed bags at each of 8 field sites to monitor the decline of viability with time.

What light do these preliminary data shed on the case for the introduction of a biological control agent for fireweed? The contrasting distributions of the two species may allow easy spread of insects on fireweed with its continuous distribution and hinder spread on *S. lautus* with its smaller, more disjunct distributions (though spread to *S. lautus* could probably not be completely avoided as populations sometimes overlap). The high genetic diversity of the native species may be more likely to produce genetic barriers to insect attack. Also, if *S. lautus* does have greater seed bank persistence, it may be able to escape insect predation for longer. However, this study is still in its early stages and more research is needed before firm conclusions can be drawn.

Economic Impact of Fireweed (Roger Cousens, University of Sydney)

Despite the belief that fireweed is worth controlling, we have little hard data on the economic benefits from its control. Only one study, by Brian Sindel, has examined competition between fireweed and pasture/fodder crops. Although that study indicated that significant losses can occur, it dwelt particularly on oat crops and improved ryegrass pastures. Much of the fireweed infestation is on unimproved or poor quality land, for which we have no data. This part of the study aims to quantify those losses.

We have surveyed the State to map, on a regional basis, the level of fireweed infestation. This was done on a coarse 0-7 scale and largely confirmed a previous mapping exercise by Neil Griffith based on district agronomists' impressions. The worst area was around Dungog and Gloucester.

Paddocks have been selected in the Camden and Nowra areas. We have established fireweed-free strips (using bromoxynil) in which we are measuring pasture biomass production. We hope to add an additional site in the Hunter Valley. It is too early to make quantitative statements from this work. However, the intention is to combine these experimental data with the survey results to estimate total state losses in pasture production.

New Control Agent Against Parthenium Weed

AQIS has approved the release from quarantine of a stem-galling weevil, *Conotrachelus* sp QDL 014, as a further biological agent to assist in control of Parthenium weed, *Parthenium hysterophorus* L. The weevil has been under study at the Queensland Department of Lands' Alan Fletcher Research Station at Sherwood in Brisbane, where it will now be bred before mass release.

Parthenium weed occurs in Queensland, New South Wales and the Northern Territory. It is an invasive annual of open land and pastures. It is not palatable to stock and can quickly dominate overgrazed pastures, given favourable conditions. The large numbers of seeds it produces in its short growing season are readily dispersed by wind, water,

vehicles and animals. The plant produces tainting of meat and, in humans, causes acute allergic dermatitis and other allergic conditions.

Infestations of the weed in Queensland are estimated to cost beef producers more than $16 million a year, with about 170,000 square kilometres of land between Injune and Charters Towers heavily infested. Scattered infestations occur over twice this area but are largely controlled once detected.

Infestations occur alongside roads leading out of Queensland into New South Wales as far as Narrandera on the Newell Highway. In the Northern Territory, Parthenium weed occurs along a stretch of the Roper River, but so far has not spread far from there. The weed is capable of growing in all States, but while it can be a serious pest in warmer regions it is unlikely to become a major problem in winter rainfall districts.

Since 1979, seven other species of insects and a rust disease have been released in attempts to control Parthenium weed. A moth, *Epiblema strenuana*, has reached damaging levels, with its larvae feeding internally in the weed's stems to form galls, giving some control. A beetle, *Zygogramma bicolorata*, caused moderate to severe damage to Parthenium weed last summer at distances up to 50 kilometres from one of its release sites, but otherwise has had little effect.

Bitou Bush and Boneseed Newsletter

This is a newsletter produced whenever something newsworthy occurs in the field of bitou bush and boneseed research. It is intended to be an informative publication which is directed at both the ordinary worker and the scientist.

The first issue highlights some of the outcomes of the recent National Workshop on *Chrysanthemoides monilifera* which was held at Sea Acres Rainforest Centre, Port Macquarie from 28th to 30th April 1993. This workshop had a broad scientific base, the highlight being a talk by Dr. Penny Edwards, the South African based CSIRO entomologist who is responsible for identifying prospective biological control agents for bitou bush and boneseed. A variety of papers were presented along with three workshop sessions intended to focus on key issues.

The proceedings of this workshop are now published and copies are available from the Editor: Royce H. Holtkamp, NSW Agriculture, RMB 944, Tamworth NSW 2340.

The workshop was summarised by Dr Jim Cullen, Head of the CSIRO Weed Biological Control Unit. A synopsis of his talk is given here.

Workshop Summary

The two-day workshop focussed on the objectives of co-ordinating the monitoring program, integration of control methods and developing a rehabilitation plan, while the aim of raising public awareness of the program was met principally by the Open Day and associated publicity.

In the workshop, the scene was set by a series of brief summaries on the first morning covering the biological control program, chemical control, the possibility of developing mycoherbicides, the activities of community groups and the current status of rehabilitation. The workshop was impressed by the range of

potential biological control agents still available and the damage they were capable of causing. Also notable was the success being obtained with herbicides in distinguishing between bitou bush and native vegetation, particularly as a result of careful timing, and the impressive efforts being made by community groups in restoring areas, largely with volunteer labour.

The workshop then dealt with the three principal aims via a series of discussion groups or internal workshops in integration, monitoring and rehabilitation.

The discussion on monitoring generally agreed that community groups could monitor the presence or absence of released agents at given sites or a series of sampling spots, and also provide useful information on population levels. To help achieve this outcome a new monitoring sheet is being designed which will be distributed to volunteer groups shortly.

Overall, three main themes became apparent through the course of the workshop:

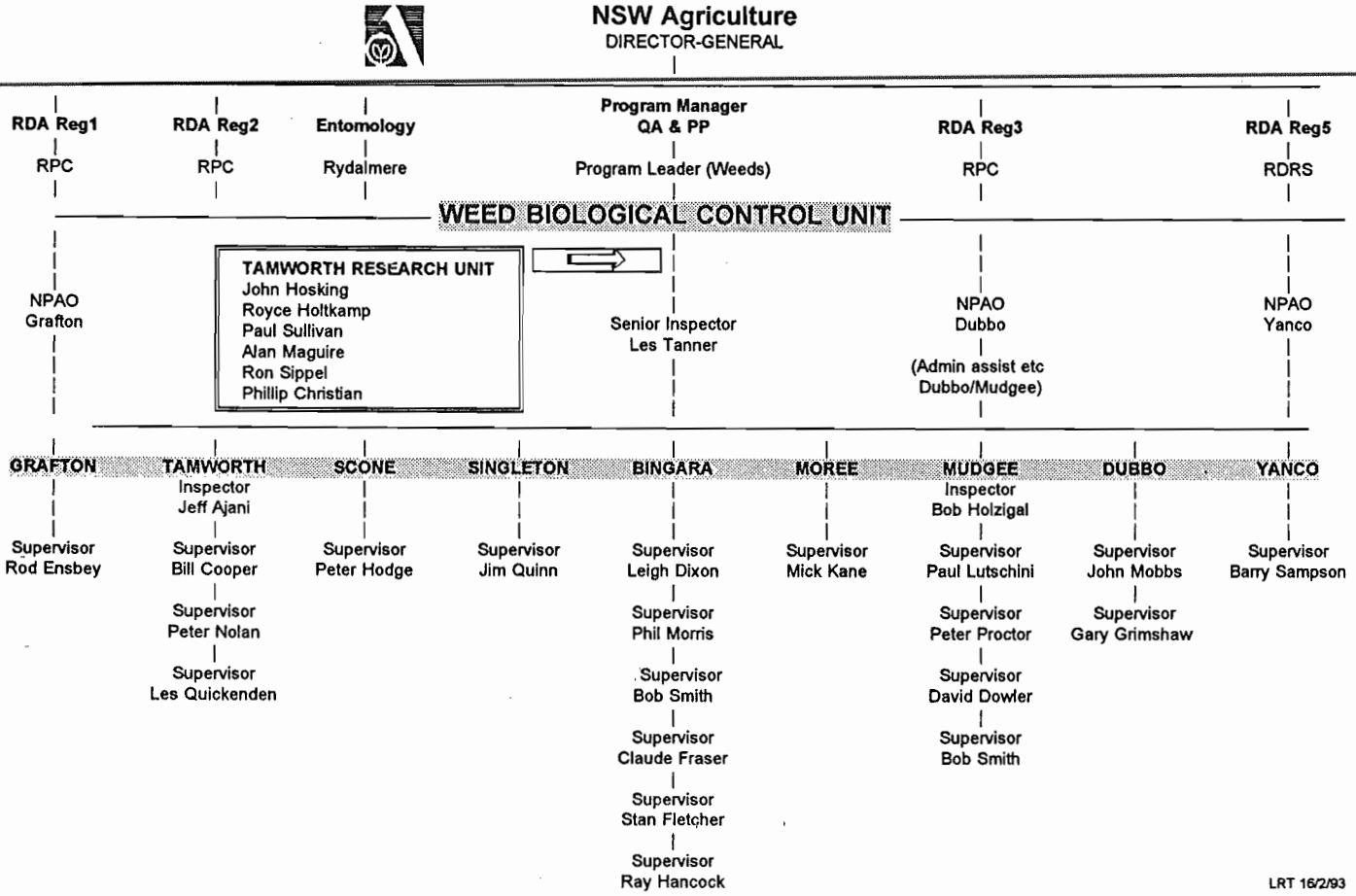
(i) The promise of biological control in view of the range of damaging agents available and the significantly lesser status of the plant in its native South Africa. This was tempered by the realisation that this will be very much a long term solution.

(ii) The need for better communication at all levels, but particularly between the local operational group, often voluntary, and those responsible for central collation of information and determining research direction. The workshop has set in place several mechanisms to assist this process. It is now a matter of making them work.

(iii) The amount of commitment that people have to do something about this weed. This is going to be important for implementing and ensuring the success of the program that is envisaged.

The Port Macquarie Workshop produced the following list of recommendations.

- Produce a national newsletter on bitou bush and boneseed using contributions from state co-ordinators.
- Produce a state plan for proposed releases of existing biological control agents.
- Produce fact sheets on available biological control agents.
- Produce an updated version of the bitou control handbook.
- Write a boneseed control handbook.
- Support the national biological control program.
- Hold biennial workshops on bitou bush and boneseed.
- Research directions
  - assess the environmental impact of chemical control
  - integrated control including categorisation of sites using a habitat/land use action matrix which can also be used in rehabilitation research
  - conduct a weed survey to identify priorities
  - mycoherbicedes
  - ecosystem rehabilitation
  - demonstrate efficacy of biological control.



WEED BIOCONTROL PROGRAMS 1993

GRAFTON	TAMWORTH	SCONE	SINGLETON	BINGARA	MOREE	MUDGEE	DUBBO	YANCO
Prickly pear	Prickly pear	Prickly pear	Prickly pear	Prickly pear	Prickly pear	Prickly pear	Prickly pear	Prickly pear
Water hy/th	B/berry rust		Water hyacynth	St John's wort	Harrisia cactus	P/Curse		St John's wort
Salvinia	P/curse		Salvinia	Rumex spp		St John's wort		Rumex spp.
Bitou bush	St Johns wort			P/Curse		Rumex spp.		P/curse
Fireweed	Scotch Broom			Administration		B/berry rust		
	Bitou Bush					Weed collection		
	Rumex spp.							

- Establish a standardised monitoring process and produce a standardised monitoring sheet.

- Acknowledge the contribution of volunteer groups in control of bitou in environmental areas.

The next bitou bush and boneseed workshop will be held in South Australia in 1995 at a venue to be determined.

Council of Australian Weed Science Societies (Inc.)

oooOOOooo

REPORT

Summary of Report to the Council of Australian Weed Science Societies for 1992-93

(Presented by M Blacklow - President)

During the year CAWSS has continued to provide a national focus on behalf of its member Societies. The Secretariat met regularly and was able to progress a number of important issues. Two general meetings via teleconference were run.

During the year CAWSS made contact with the Australian and New Zealand Environment and Conservation Council (ANZECC) who have developed a "Network on Weeds of Conservation Concern". The Chairman of the Task Force is Dr Mark Lonsdale and the Convenor Dr Stella Humphries of the CSIRO Division of Wildlife and Ecology. The Network is to oversee and report on all aspects of research into environmental weeds and to advise Standing Committee on Conservation on national priorities.

Mr. Richard Carter has been nominated as the CAWSS Member on the Network Core Committee.

Plant Protection Quarterly continues to gain more prestigious status within the plant protection industry. A new initiative to improve subscriptions was developed during the year by Ron Diver and the publisher with promising results. CAWSS contributed financially to upgrading the desk-top publishing capacity of the journal.

The Publisher may put a proposal to AWC to publish the Biology of Australian Weeds series in Plant Protection Quarterly.

CAWSS supported IWSS nomination for Copenhagen, Denmark as the host country for the next IWCC and this has now been confirmed for 25-28 June 1996. The first circular is now in circulation.

CAWSS has been fortunate in having an active member society person as AWC Secretary for many years who was able to provide close liaison between the two organisations. It seems likely that AWC membership will not be expanded to include organisations such as CAWSS and our observer status will have to be catered for on an ad-hoc basis.

The Secretariat circulated a first draft of a CAWSS mission statement to member societies for comment at the annual general meeting. It is hoped to finalise the drafting of this document during the forthcoming year.

CAWSS had submitted comments on the proposed National Weeds Strategy in its development stages and was also invited to comment on the draft. Some 570 copies of the draft had been requested

and about one hundred submissions received. After a rewrite of the first draft the document was put to SCARM who declined to accept the strategy in the form presented and has commissioned a further rewrite for consideration at its February 1994 meeting.

The President of EWRS invited CAWSS President to attend a special meeting of EWRS in Germany while he was on sabbatical leave in Europe. The meeting was called to discuss the rehabilitation of East European Science and teaching systems.

A gavel has been commissioned in honour of Ron Diver, CAWSS Secretary/Treasurer from 1990 until his untimely death in May 1993. Ron was instrumental in developing many of the initiatives now in place as CAWSS policy.

oooOOOooo

BOOKS

Management of Agricultural Weeds in Western Australia

Edited by J Dodd, R Martin & M Howes and written by officers of the Department of Agriculture and related agencies. 280 pages includes hundreds of glossy photographs, tables and graphs. The 14 chapters are dedicated to biology and ecology of weeds, integrated weed control, preparing for a crop, weed competition and economics of control, weed control in field crops and pastures, understanding herbicides, tolerance of crops and pastures to herbicides, herbicide resistant weeds, weed control around the farm, herbicide application, safe handling of herbicides and training and regulation.
Published by the WA Department of Agriculture as Bulletin 4243. Distributed by Kondinin Group - Free phone (008) 998355. By mail through Information & Media Services, Department of Agriculture, Baron Hay Court, South Perth 6151 @ $50 (includes postage). A 30% discount applies for orders of 10 or more.

CSIRO Handbook of Economic Plants of Australia

This authoritative and up-to-date reference on scientific and common names of economic plants found in Australia. Includes economic uses, geographic distribution, life form, duration and supplementary information such as origin. Available from CSIRO Publications, PO Box 89, East Melbourne, 3002. Price $50 plus 10% postage and handling.

NZ Agrichemical & Plant Protection Manual

- listings of all agrichemicals used in NZ, their properties, active ingredients and uses.
- trouble-shooting cross-references from weed, pest and disease problems to suitable agrichemicals.
- trade name/common name cross references
- pesticide resistance and how to prevent it, IPM and legislation
- spray and safety equipment directories.

Available from NZ Agrichemical Manual, PO Box 11-092, Wellington, N.Z. Price $A60 airmail.

DIARY OF CONFERENCES

18-20 November, 1993
International Symposium on Integrated Weed Management for Sustainable Agriculture. Hisar, India. Contact: R J Malik, Department of Agronomy, CCS Haryana Agricultural University, Hisar 125 004, India.

22-25, November, 1993
Brighton Crop Protection Conference:Weeds. Brighton, UK. Contact: Conference Assoc & Services, 55 New Cavendish St, London WIM 7RE, UK. Fax. 071 935 7559.

9-10, December, 1993
Herbicide Resistance Workshop. Edmonton Canada. Contact: John Donavon phone (403)632-8208.

7-10, February, 1994
1994 WSSA Meeting. St Louis, USA. Contact: J Kennedy, Monsanto, 800 Lindberg Blvd, St Louis, Mo 63167, USA.

19-22 April, 1994
2nd International IPM Symposium/Workshop. Las Vegas, Nevada, USA. Contact: R Kuhr, Dept. Entomology, Box 7613, North Carolina State University, Raleigh, NC USA, 27695-7613.

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, Sakyoku, Kyoto 606, Japan.

6-10 February, 1995
4th International Symposium on Adjuvants and Agrochemicals. Melbourne, Australia

2-7, July, 1995
XIIIth International Congress on Plant Protection. The Hague, Netherlands. Contact: Dr J C Zadoks, Wageningen Agricultural University, POB 8025, 6700, Wageningen, Netherlands.

September, 1995
15th Asian/Pacific Weed Science Society Conference, Japan.

25-28 June, 1996
2nd International Weed Control Congress. Copenhagen, Denmark. Contact: Secretariat, ICSS Strandvejen 171, PO Box 41, DK-2900 Hellerup, Denmark.

September, 1996
11th CAWSS Conference. Melbourne.

oooOOOooo

NSW WEED SOCIETY AGM AND ANNUAL DINNER AT ORANGE

Thursday 25th November, 1993

Seminar will be held in TRAINING ROOM, Ground Floor, NSW Agriculture, Head Office, 161 Kite Street, Orange.

Seminar Program

10.30 am	Registration and Morning Tea	
11.00 am	New Weeds Legislation	- Sally Pearmain - Andrew Leys - Bob Trounce
	Includes a discussion on Weed Categories	
12.45 pm	LUNCH (in Seminar Room). Lunch will cost $10.00, RSVP if required.	
1.30 pm	Update on Weeds Programs	- Andrew Leys
2.00 pm	Dodder - Statewide Campaign	- Bob Trounce
2.20 pm	Silverleaf Nightshade Research	- Gerry Hennessy
2.40 pm	Herbicide Resistance Strategy	- Jim Dellow
3.00 pm	AFTERNOON TEA	
3.30 pm	**Annual General Meeting**	
7.00 pm	for 7.30 pm **ANNUAL DINNER**	

Venue - Duntryleague Golf Club
Woodward Street, Orange

Dinner will be $25 per head for 3 courses or
$19 per head if Weed Society prefers only 2 courses.

Accommodation available, phone 063-623602.

Please phone if you require more details. **RSVP by Friday 19th November** to Bob Trounce, NSW Agriculture, Orange. Phone: 063-913159. Fax: 063-913206.

THE WEED SOCIETY OF NSW NEWSLETTER

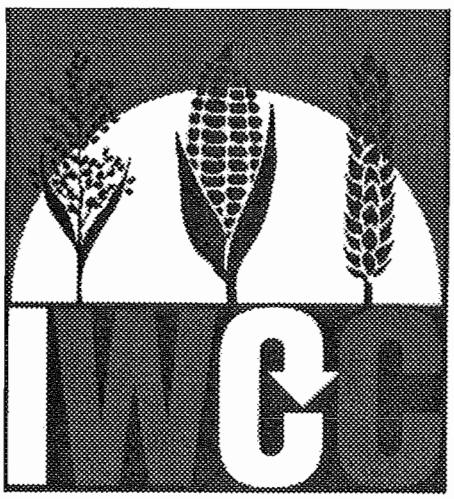
If undelivered please return to:
PO Box 438
WAHROONGA 2076

SECOND INTERNATIONAL WEED CONTROL CONGRESS

Copenhagen, Denmark 25–28 June 1996

Hosts: International Weed Science Society (IWSS)
European Weed Research Society (EWRS)

Patron: His Royal Highness, Prince Joachim



SECOND INTERNATIONAL
WEED CONTROL CONGRESS

The International Weed Science Society has selected Denmark to host the Second International Weed Control Congress. The Congress will take place in Copenhagen from 25–28 June 1996 and the Organizing Committee takes pleasure in inviting you to attend.

Although Weed Science and Technology is highly developed the costly struggle to control weeds continues. The theme of the Second International Weed Control Congress will be *Rationalizing Weed Control Options*. All of us need to be international in our activities, outlooks and standards. This Congress gives you the opportunity to continue contact with weed scientists from other countries to pursue these objectives.

Weed control is essential to ensure an adequate supply of food, fibre and fuel. The Congress will provide a forum in which efficient weed control strategies can be discussed within frameworks of stringent environmental considerations.

Submission of abstracts: 1 May 1995
Submission of papers: 1 Nov 1995
Submission of camera-ready papers: 1 March 1996
Reduced fee for early registration before 1 March 1996

PROGRAM (PROVISIONAL)

Biology for weed control:

- Invasiveness
- Interference
- Changes in flora
- Population dynamics
- Herbicides: resistance, selectivity
- Species: systematics, ecology

Current options for weed control:

- In world crops, horticulture
- In forests, pastures