

A Good Weed

The Newsletter of the Weed Society of New South Wales Inc.

ISSN 1325-3689

#41 February 2007



Top to bottom; Fat hen, variegated thistle and wild radish seedlings University of California UCIPM Online

In This Issue

Presidents Column New Members Travel Study Grant Coming Events Coming Events – Weed Society of NSW Report on the Annual General Meeting 2006 Presidents Report for 2006 Treasurers Report 2005/06 Weed Society of Victoria - Seminar Invitation to Attend the 14th Biennial NSW Weeds Conference 2007 Pictures from the AGM Meet the Committee – Emilie Ens CAWS Matters New Herbicide – Summit Ecopar 20SC Herbicide Further Papers from the Olive Workshop –Orange Feral Olives in South Australia Impacts and Management **Subscriptions** Further Papers from the Poisonous and Allergenic Plants Seminar Poisonous and Allergenic Plants Where are They? Ros Shepherd Poisonous, Prickly, Parasitic, Pushy? Prioritising Weeds for Control Programmes John Virtue Asthma Weed Education and Incentives Project Sue Stevens Weed Proofing Australia A Way Forward on Invasive Garden Plants Andreas Glanznig

A Good Weed is Published by the Weed Society of New South Wales Inc., PO Box 438, Wahroonga, NSW, 2076. Website: www.nswweedsoc.org.au

Secretary: Alan Murphy. Material for the Newsletter should be sent to the Editor at the above address.



THE WEED SOCIETY OF NEW SOUTH WALES INC.

Office Bearers for 2006/07

President	Stephen Johnson [Orange]
IPP	Warwick Felton [Tamworth]
Secretary	Alan Murphy [Umina]
Treasurer	Jim Swain [Sydney]
Public Officer	Mike Barrett [Sydney]

Other members of the Committee

Assistant Secretary	Emilie-Jane Ens [Wollongong]	
Newsletter Editor	Mike Hood [Sydney]	
Assistant NE	Lawrie Greenup [Sydney]	
CAWS Delegates	Rex Stanton [Wagga Wagga], Stephen Johnson [Orange]	
Committee	Peter Harper [Ingleburn], Peter Dowling [Orange], Rex Stanton [Wagga], Jim Dellow	
	[Orange], Luc Streit [Sydney], Alex McLennan [Sydney], Bob Trounce [Orange],	

Committee meeting dates have been set as follows;

April 20	Katoomba Council Chambers	October 19	Orange [date and time may be changed]
June 15	Forestry, West Pennant Hills	December 14	TBA
August 17	Wollongong		

All members are welcome at meetings; check with the Secretary for the final date, time and place as changes can be made to these arrangements.

Aims of the Weed Society of NSW

The Society was formed in 1966, the first weed society in Australia. It is affiliated with similar societies in Queensland, Victoria, South Australia, Western Australia, Tasmania and New Zealand under the umbrella organisation The Council of Australasian Weeds Societies [CAWS]

The aims of the society are:-

- o To promote a wider interest in weeds and their management
- To provide opportunities for those interested in weeds and their management to exchange information and ideas based on research and practice.
- o To encourage the investigation of all aspects of weeds and weed management
- o To co-operate with other organisations engaged in related activities in Australia and overseas
- To encourage the study of weed science and the dissemination of its findings
- To produce and publish such material as may be considered desirable

Membership is open to all and costs \$30 per annum. For an application form contact the Secretary at PO Box 438 Wahroonga, NSW, 2076 or www.nswweedsoc.org.au

Presidents Column

New beginnings - Life is about change. Change has recently found us here at the Weed Society. Recently I was elected President of the society. This was certainly a change for me.

I come to you from a diverse background that includes the management of noxious weeds, research into weed control in irrigated and dryland cropping systems in the northern grains zone, pastures research in temperate and semiarid areas, and from beef and mixed wheat/sheep production systems. I have been on the Weed Society executive for four years and a delegate for the Council of Australian/Australasian Weed Societies since that time.

The society also finds itself in a time of change. We have been well served by our long standing, experienced and wise executive, many of whom continue to serve after retiring from full time work. Recently the executive has been joined by new and young members and they are a welcome addition to the executive team. In particular, I would like to welcome Emilie-Jane Ens our new Assistant secretary. Emilie brings both energy and enthusiasm to the team as well as helping addressing the gender balance of the Executive. I would also like to welcome all our newest members who have joined us over 2006 and even 2007. We look forward to getting to know you better.

Change can provide opportunities but it can also be confronting. This is always going to be the case but I hope that in the year ahead we can see a number of positive changes. When I think of change I like to consider a quote I once heard, that for many of the young today "change is the only constant". There is an element of truth in that saying and it is something we could all consider as we seek to engage, educate and mentor those who will follow us.

As an executive we hope to keep on serving you by keeping you informed about news,

views and upcoming events in 'The Good Weed', updating you on Weed Society of NSW and Council of Australasian Weed Society grants and awards and promoting better weed management and information sharing throughout NSW. We will be hosting seminars again this year as well as investigating how we can better support others to help with the task of weed management. I expect that you will have a lot to read about soon!

I thank you all for your ongoing support. I also make one commitment to you as fellow members. If you have any ideas or suggestions on how we can improve the society I am only too happy to hear these and to take them to your executive for consideration. I look forward to serving you as your President. Happy weeding

Stephen Johnson (Dr.)

New Members

Welcome to the following new member:-Peter Turner, B.App.Sc., Weed Ecologist, Pest Management Unit, Department of Environment and Conservation NSW, Hurstville.

At this point of time your Society has 173 paid up members.

Travel Study Grant

A useful benefit offered to members by the Society is the Travel Study Grant. This grant is primarily designed to offer assistance with travel costs to a conference held within Australia or overseas; although a study trip may also be funded.

Applications close on June 30 each year, but may be submitted at any time. For application forms and further details contact the Secretary.

A report is expected from recipients on his or her return. This will be published in this newsletter.

Coming Events

- **14th Biennial NSW Weeds Conference**, University of Wollongong, Wollongong from Tuesday 25 Thursday 27 September 2007. [Previously known as the local government weeds conference].
- **3rd Biennial Victorian Weeds Conference**, 3-4 October 2007, Bendigo, Victoria Earth Wind Fire Water and Weeds. Email secwssv@surf.net.au.
- 16th Australian Weeds Conference. Cairns, north Queensland. 19-22 May 2008. <u>www.16awc.com.au/</u>
- 9th International Conference on the Ecology and Management of Alien Plant Invasions. Hyatt Regency Hotel, Perth, WA. 17-21 September 2007. Organised by the Weeds Society of WA [WSWA]. <u>www.congresswest.com.au/emapi9/</u>.
- 5th International Weed Science Society Conference. Vancouver, Canada, 2008.
- 9th Symposium of the Weed Society of Queensland. June 3-6 2007. Gold Coast, Queensland. <u>www.wsq.org.au</u>
- **41st Weed Society of Victoria AGM and Seminar** Over the garden fence and far away... communities actions on weeds 19 April 2007.
- 14th Symposium European Weed Research Society, Hamar, Norway. 18-21 June 2007. <u>www.EWRS-Symposium2007.com</u>

Coming Events – Weed Society of NSW

- A seminar is being organised for June or July 2007 on the subject of environmental weed management probably titled 'Current issues with environmental weeds research and management'
- A students presentation seminar is being planned for Wagga Wagga later in the year
- The Annual General Meeting will be held this year in Orange in November along with a seminar

Further details on these events will be announced in the next newsletter.

Report on the Annual General Meeting 2006

The AGM was held at Pennant Hills Golf Club in November with a moderate attendance of members presenting. The President and Treasurer presented their reports [see below] and elections were held.



Stephen Johnson, incoming President, at the AGM

Dr. Stephen Johnson was elected President. Stephen works with NSWDPI at Orange and he is looking forward with enthusiasm to his period as President. I am sure new ideas will flow freely. The other office bearers remain unchanged, with Allan Murphy as Secretary, Jim Swain as Treasurer and Mike Barrett as Public Officer. Other members of the committee are listed on the back of the front page. Emile-Jane Ens, a PhD student at the University of Wollongong, joins the committee for her first time – welcome Emile-Jane.:- The AGM was preceded with a weed walk around the golf course with Richard Kirkby, the Superintendent and Tony Laxton, Horticulturalist, from the Club giving talks. Pennant Hills Golf Course is one of the premier courses in Sydney and it prides itself on its splendid gardens, well maintained bush areas and a scenic and excellent, although not long, course. This part of the day was not well supported but those who did attend were well rewarded with interesting talks on golf course and bush management. Photographs taken on the day are given elsewhere in this newsletter.

The annual dinner followed the AGM. This was well attended, and the food, service and company were first class. Thanks go to Mike Barrett, a member of this club, for organising the day.

President's Report for 2006

Warwick Felton President

A 40th anniversary luncheon was held at the CTA Club in Sydney in April to celebrate the formation of The Weed Society of New South Wales. Kelvin Green and Peter Michael were two of the early Presidents of the Society who attended and they reflected on some of the activities at that time. Many other past Presidents also attended what was a most enjoyable occasion.

The Society provides an opportunity for anyone with an interest in weeds to enhance their understanding of the problems posed by weeds. It has had strong links with the agro-chemical industry, Universities, Agricultural Colleges, and the Department of Agriculture. Weeds in industrial and environmental situations have become significantly more prominent in recent years so the Society has become involved in a wider scope of activities to reflect this trend.

With the increasing proportion of members whose interests are more aligned to environmental issues such as landcare, bush regeneration and catchment management, it is essential that the Newsletter and seminars target all these groups. This will mean that some functions will attract fewer attendees but this should not discourage the executive from organising these.

However, this diversification, the reduced number of chemical companies, the declining emphasis on agriculture, and increasing age of the members, has contributed to a reduction in membership numbers.

Despite the creation of a CRC for Weed Management there have been relatively few new members from the CRC. Better liaison through CAWS should be undertaken to promote the value of weed societies to those in the CRC, and to any other organisation involved in weeds. The CRC has not been supported for a third round of funding so will cease in 2 years.

The Newsletter is the main avenue of contact for most members so it is imperative that it continues to maintain the high standard that has been provided for many years now. I particularly acknowledge Mike Hood for his dedicated role as editor, and to the assistance given to him by Lawrie Greenup. I urge all members to consider making a contribution to the Newsletter.

The Society initiated a forum on feral olives held at Orange in August. This provided an opportunity for a clearer understanding of the potential of this problem to be defined, and to develop better strategies for future management. I thank Stephen Johnson, Peter Dowling, Jim Dellow, and Bob Trounce for organising this function.

In September a seminar was held at the State Library, Sydney on poisonous and allergenic plants. An excellent program was formulated with an expert panel of speakers, Rachel McFadyen Director of the CRC for Weed Management, John Virtue Department of Water Land & Biosecurity Conservation in

South Australia, Sue Stevens Randwick City Council, Ros Shepherd Weed Society of Victoria, Andreas Glanznig WWF Australia, Belinda Riddle Biosecurity Australia, Stephen Johnson NSW DPI, and Genevieve Adamo NSW Poison Information Centre. They discussed some of the poisonous plants in Australia, priorities for control, community education, weed risk, and legislation. I thank Lawrie Greenup, Mike Barrett, Bertie Hennecke and Luke Streit for organising this function.

I thank Mike Barrett for arranging the visit to Pennant Hills Golf Club for an inspection of their work on turf management and bush regeneration, and the annual dinner.

Overall attendance at the functions in 2006 was disappointing. This is probably related to the topics being specialised and therefore not having appeal to many members of the Society. The executive did think that we would attract more non-members to the functions than occurred. It is a difficult task to market outside the membership but this should be pursued, possibly with more collaboration with other organisations.

The Executive Committee was very committed to the Society in 2006 with all meetings being well attended either in person, or by teleconference. I thank them all for their support during my term as President in 2005 and 2006. Jim Swain (Treasurer) and Alan Murphy (Secretary) have been tireless contributors to the Society and Stephen Johnson and Rex Stanton have very capably represented the Society to CAWS in 2006.



Outgoing President Warwick Felton and Maureen Felton at the AGM dinner

The Society undertook a review over the last two years because of the decline in membership numbers and the increasing age of the members. Initiated by Mitch Michelmore and completed by Peter Dowling it showed that the members are very supportive of the Newsletter. The increasing interest in environmental issues was reinforced while some believed the Society should become more pro-active in promoting weed issues, and more cooperation should occur with other organisations that have an interest in weeds.

The Society is in a sound financial position so the short to medium term future remains promising. Radical changes are probably not

required. But there is an ongoing need to continue to align the Society activities with member expectations, and to broaden the membership base. This is the challenge for the future viability of the Society.

I wish the incoming executive every success in continuing to develop and deliver an effective Society both to the members, and the wider community of New South Wales.

23 November 2006

Treasurers Report - 2005/06

Jim Swain. Hon. Treasurer.

The following is an edited version of the report presented at the AGM in November 2006. Details accounts are not presented.

• Membership.

The society has as at the 1st October 2006 167 members. Of those there are 3 life members, 140 financial members for 2006 and 24 who are unfinancial for 2006. 17 organisations/ societies receive the newsletter.

There are 5 sponsors for the newsletter – A Good Weed; viz Dow, Scotts, Bayer, Syngenta and Luhrmann.

Throughout the year we have removed from the membership list those who were unfinancial for more than 2 years.



Secretary Alan Murphy, Treasurer Jim Swain and Robyn Swain at the AGM dinner transparent report.

• Audited Financial Report.

The audited financial report for the financial year 1^{st} October 2005 to 30^{th} September 2006 was presented for approval.

This year we have changed our auditors from Thomson Hall at Campbelltown to Thomas Quinlan at Hornsby. This change was made for a number of reasons and the change was approved by the executive in December 2005. Thomas Quinlan have had to spend some additional time during this audit period to amend the reporting for the societies funds to more realistic allocations. This will also give us as you will see a more

As you will see we have incurred a loss of 4,136.90 for the year with losses for seminars and special events – the 40^{th} birthday and the 2005 AGM incurring a loss of 2,822.98. Sponsorship covered about half of this loss.

We have continued to use the Bendigo Bank at Turramurra for the societies banking and have 2 accounts there. A cheque account and a cash management account.

The cash management account has a lower figure as at 30th September 2006 - \$67819.51 than the corresponding period last year - \$69,609.73, due to the need to transfer an amount of \$5,000 to the cheque account to cover cash flow.

Weed Society of Victoria – Seminar

'Over the garden fence and far away – Communities action on weeds'

Thursday 19 April 2007, Burrinja Community Centre and Gallery, Matson Road, Upwey [Melway 75 B12]

Examining the problems that face community groups attempting to clear an area of weeds, and what they can do to clean up a weedy area so that it does not become a sea of seedlings but an area of restored bush.

Enquiries : Ros Shepherd, <u>secwssy@surf.net.au</u> or 03 9576 2949

Invitation to Attend 14th Biennial NSW Weeds Conference 2007

The organizing committee is delighted to extend an invitation to you to participate in the 14th Biennial NSW Weeds Conference, to be held at the University of Wollongong, Wollongong from Tuesday 25 – Thursday 27 September 2007. As the northern gateway to the Illawarra and South Coast regions, Wollongong will provide an exciting and vibrant backdrop for the 2007 Event, and we expect that many of our delegates will take the opportunity to visit some of the region's many renowned attractions.

The Conference venue, Wollongong University, is located in one of the most beautiful settings in Australia, just an hour drive south of Australia's largest city Sydney. The University of Wollongong's main campus occupies a site of 82.4 hectares, nestled between the escarpment of Mt Keira and the nearby Pacific Ocean. The environment is open, spacious and extensively landscaped, with native vegetation and water gardens being a feature. It is also located adjacent to the Wollongong Botanic Garden.

The Conference Program will feature a number of outstanding local and national speakers, concurrent sessions a trade display and expo. There will also be field trips and practical demonstrations. The Conference attracts researchers and practitioners from all around the State and Australia and provides a wonderful opportunity to meet and extend contacts.

Above all else, we invite you to enjoy the warm hospitality that Wollongong and its people have to offer, and that you too will share in the feeling of excitement that our conference and city will generate. Vanni De Luca

vanni De Luca

ORGANISING COMMITTEE

Vanni De Luca, Wollongong City Council – **Conference Chair** Michael Malady , Wollongong City Council – **Treasurer** Sydney Lisle, NSW DPI <u>Technical Sub Committee</u> David Pomery , Illawarra District Noxious Weeds Authority – **Chair** Graham Harding, Eurobodalla Council Ann Herbert, Bega Valley Shire Council Ian Borrowdale, Shoalhaven City Council Mich Michelmore, NSW DPI <u>Sponsorship & Marketing Sub Committee</u> Craig Shephard , Sydney South Region, NSW National Parks & Wildlife Service –**Chair** Peter Stuckey , Kiama Council Geoff Keech, Macspred Australia <u>Social Program Sub Committee</u> Paul Carter, Shellharbour City Council – **Chair** Www.weeds2007.com.au Email - weeds2007@iceaustralia.com



Rae & Peter McMaugh at the AGM dinner



Luc Streit and NZ visitor



Mike & Carolyn Hood share a joke with Peter Dowling



John Toth, Barrett, Toth and Mike Barrett enjoying themselves



Morning Glory at PHGC



Tony Laxton explains bushland weed control at PHGC



Richard Kirkby and his equipment



Competitive grass cover at PHGC

Meet the Committee - Emilie Ens

Emilie Ens is our new Assistant Secretary; she is currently in the final stages of her PhD at the Institute of Conservation Biology, University of Wollongong. Her PhD research is centred on investigations into the population and physiological impacts of bitou bush (*Chrysanthemoides monilifera* spp. *rotundata*) invasion on native flora and the soil chemical changes associated with this invasion. Her undergraduate training was conducted at UNSW which she completed with 1st class honours for her research on the distribution of Chilean needle grass (*Nassella neesiana*) on the Cumberland Plain and the impacts on the invertebrate community. Her passion for plants has been developed from a young age where she followed her father on bushwalks through their bush blocks in Bilpin (Blue Mountains) and Creewah (near Bombala). She has since been a keen volunteer bush regenerator in Sydney and Wollongong and has worked for ABR (Australian Bushland Restoration) on Sydney's Northern Beaches and Greening Australia on the Cumberland Plain. The intriguing phenomenon of environmental weed invasion and the underestimated threats to biodiversity and ecosystem health have driven her enthusiasm for research in these conservation related fields.



Since studying in Wollongong, she has been an active member of the Wollongong Uni Postgraduate Student Association where she has been the President and VP over the last couple of years. Her involvement in University committees and student representation has given her a sound knowledge of corporate governance and organisational duties and she is now looking forward to applying that knowledge by contributing to professional societies and environmental organisations. As well as being a member of the Weed Soc of NSW for the last 5 years, she is a member of the Ecological Society of Australia and a board member of the Invasive Species Council. The latter being an NGO whose primary aim is to lobby against new exotic species incursions and raise awareness of invasive species in general.

As part of the Weed Soc of NSW she hopes to contribute to the upkeep of the society as well as promote activities dealing with environmental weeds, such as the July seminar on current issues in research and management in Sydney. Look out weeds, her she comes!

CAWS Matters

A report on the latest CAWS meeting from Rex Stanton and Stephen Johnson follows.

CAWS Medal and Awards

CAWS Medal – Nominations for this medal will be received up until 30th May 2007. If you know of someone who has made an outstanding contribution to our knowledge of weeds and their control you may wish to nominate them for this award. Details can be obtained from the Secretary.

Applications for the following CAWS awards are invited and should be with CAWS by 1 May 2007. Details from the Secretary.

- CAWS annual student travel award
- CAWS early career weed scientist award

Report on the CAWS meeting held 24 January 2007

Introduction

The CAWS meeting held 24 January 2007 was held to progress a number of issues that had arisen since the September 2006 meeting. It replaced the normal February meeting.

The following report contains a summary of this information.

Business arising/General business

- 1. <u>Treasurers report</u>. Reserves currently stand at over \$119,000.
- 2. <u>Election of Office bearers</u>. John Virtue President (SA), Sandy Lloyd Vice President (WA) and Dennis Gannaway, secretary/Treasurer (SA).
- <u>16th AWC Proceedings on CD</u>. Most societies indicated that they would prefer hard copies of AWC proceedings. The Qld society (as organisers of the 16th AWC) are reconsidering whether CD or CD/hard copy combinations are appropriate.
- 4. The <u>CAWS constitution</u> was accepted with minor changes.
- 5. <u>CAWS logo</u>. The new CAWS logo is the grass logo and after a few minor amendments including centring of the land masses, this will be used in future.
- 6. <u>NT society</u>. Various society constitutions have been sent but otherwise there were no developments reported to CAWS at the meeting.
- 7. <u>National plant labelling scheme</u>. CAWS continues to lobby the Federal government about the introduction of such a scheme.
- 8. <u>Lord of the Weeds</u>. Society members have been asked to submit their state contributions to CAWS so that CAWS can better allocate appropriate support. This has now occurred in NSW's case.
- 9. <u>International Weed Science Congress</u>. CAWS is happy if NSW wishes to pursue a bid even though other state societies are not interested in doing so. Informal advice received from one delegate indicated that scientists in Qld may be preparing a bid for the Asia/Pacific Weeds Conference. This has not been confirmed.
- 10. Summary of important information from state reports. SA requested newsletter mention that they have a number of calendars containing botanical drawings of weeds left for purchase (the purpose of the calendars is to raise awareness not for profit). WA is planning for the EMAPI conference in September 2007. VIC is planning activities for this year. NZ is calling for abstracts for their 2007 conference in Napier (14-16 August) with the proceedings published in the NZ Plant Protection Journal (peer reviewed). TAS are conducting a membership drive after a successful year completing many goals. QLD is busy organising its state weeds conference and the 2008 16th Australian Weeds Conference in Cairns), 18-22 May.
- 11. <u>CAWS dinner paper</u>. A paper raised by the NSW Executive on the legitimacy of providing dinner to CAWS members and conference organisers at selective functions was not supported. All society delegates (excepting NSW) felt that the interpretation of the CAWS constitution taken by the NSW Executive was too narrow and motions to seek legal advice were defeated on vote. Conference policy will be adjusted to reflect current practice.

- 12. <u>15th Australian Weeds Conference</u>. A final report from the 15th AWC is being prepared. At this stage the CAWS share of the profits from the conference will be around \$17,000.
- 13. <u>Sainty publication</u>. CAWS is still awaiting advice from Sainty and Associates regarding the suitability of the contract between the two parties.
- 14. <u>Strategic plan</u>. A subcommittee comprised of President John Virtue, SA delegate Rachel Melland and TAS delegate Andrew Laird is to prepare a draft revision of the current (outdated) strategic plan.
- 15. Online availability of AWC and PPQ papers. The group responsible for this is yet to meet.
- 16. <u>Weed Wise Nursery award</u>. All state societies are encouraged to nominate a nursery for this award. There will be only one Australian and another NZ winner, although state societies may wish to award a prize at their own discretion.
- 17. <u>17th AWC</u>. CAWS offered in-principle support to the NZ society hosting the 17th Australian Weeds Conference at Christchurch Convention Centre from Sunday 26-Thursday 30 September 2010. Christchurch offers good travel connections, hotels and potential field trips as well as being close to a number of tourist attractions (e.g. the snow fields).
- 18. <u>CAWS medal for leadership</u>. Nominations for the CAWS medal for 2007 will close on 30 May. Societies are asked to present nominations to CAWS by the end of May to ensure that the committee can judge the applications. It is hoped the medal will be presented in September at the EMAPI conference in Perth.

Actions for Weed Society of NSW

- 1. Consider the response from CAWS on the dinner paper put by the NSW Executive.
- Consider nominating a nursery in NSW or the ACT for the CAWS Weed Wise Nursery award by April 2007. Entry forms are available on the CAWS website (<u>http://home.vicnet.net.au/~weedss/</u>). (Note: the 18 August 2006 meeting requested that L. Greenup and S. Johnson prepare a discussion paper for the executive on the relative merits of the award. This has not been prepared yet. Given this, the most appropriate form of action now needs to be determined).
- 3. Consider a nomination for the 2007 CAWS medal (due 31 July 2007). Entry forms are available on the CAWS website.
- 4. Advertise a. CAWS Annual student travel award (due 1 May 2007);
 - b. CAWS Early career weed scientist award (due 1 May 2007); and
 - c. NSW Travel support grant (due 1 June 2007)

Next CAWS Meeting 26 April 2007

Report prepared by Dr Stephen Johnson, Orange and Dr Rex Stanton, Wagga Wagga (CAWS delegates)

New Herbicide

Summit Ecopar 20SC Herbicide is a new herbicide shortly to be released by Summit-Agro Australia Pty. Ltd. It is a contact post-emergent foliar herbicide based on the new active ingredient, pyraflufen-ethyl. The active ingredient was discovered by Nihon Nohyaku Co. Ltd. of Japan. ECOPAR is for the control of a range of broadleaved weeds in wheat, oats, barley, triticale and cereal rye, at the application rate of 400 mL of ECOPAR + 500 mL MCPA Amine 500 per hectare. The ECOPAR rate is equivalent to 8 grams of active ingredient per hectare.

Weeds to be included on the product label include bedstraw [*Galium tricornutum*], bifora [*Bifora testiculata*], capeweed [*Arctotheca calendula*], Indian hedge mustard [*Sisymbrium orientale*], long storks bill [*Erodium botrys*], prickly lettuce [*Lactuca serriola*], volunteer canola, volunteer lupin, wild radish [*Raphanus raphanistrum*] and wild turnip [*Brassica tournefortii*].

The herbicide should be applied to actively growing weeds up to the 6-leaf stage and/or not more than 12 cm in diameter and when the crop is between 2 leaves and mid to late tillering. Herbicide effects can occur within 1-7 days of application.

It cannot be mixed with selective grass herbicides as grass weed control is markedly reduced and excessive crop injury may occur. Mixing with wetters, crop oil concentrates and oil/surfactant blends may also increase crop injury without increasing weed control and is not recommended.

Pyraflufen-ethyl is a member of the aryl triazolinone group of herbicides [Group G]. Its mode of action is through a process of membrane disruption which is initiated by the inhibition of the enzyme protoporphyrinogen oxidase. The inhibition interferes with the chlorophyll biosynthetic pathway.

ECOPAR is rainfast after 6 hours. It is non volatile and has a very short soil half-life not providing any residual activity. Pyraflufen-ethyl in practically non-toxic to birds, honeybees, earthworms and fish, and slightly/moderately toxic to aquatic invertebrates. It has been scheduled as an S5 chemical and will be labelled with a CAUTION warning. This is the lowest of the poison schedules. Only non-scheduled is lower.

Details provided by Summit Agro Australia Pty. Ltd. Email – customerservice@summit-agro. com.au.



Residue studies in cereals - Narrabri [photos courtesy of Agrisearch

Further Papers from the Olive Workshop - Orange

Errata: In the last edition of A Good Weed the olive names under the line drawings were reversed.

(4) FERAL OLIVES IN SOUTH AUSTRALIA: IMPACTS AND MANAGEMENT

Dr Neville Crossman

Research Scientist, Policy and Economic Research Unit, CSIRO Land and Water PMB 2, Glen Osmond, SA, 5064

Introduction

The olive (*Olea europaea* L.), imported into Australia and subsequently cultivated for economic purposes, has spread into native vegetation in several regions of southern temperate Australia. The impacts of olives going 'feral' have only recently been quantified. It is reported that native plant species diversity and canopy cover was 50% and 80% lower, respectively, in native eucalypt woodland heavily invaded with feral olives. Consequently, feral olives are considered an environmental weed as well as being proclaimed a Pest Plant in SA.

Distribution

Olives have naturalised across a wide range of habitats in South Australia. Occurrences are predominantly within the 400mm to 600mm median annual rainfall range. The highest concentrations occur on the western foothills of the southern and central Mount Lofty Ranges, directly to the east and south of Adelaide. These populations are likely to be the direct descendants of the orchards planted in the late-1800s/early-1900s. Other large concentrations in SA can be found in the Barossa and Clare valleys. The occurrence of a small number of feral olives in drier locations suggests that the species can survive in regions that receive less than 500mm average annual rainfall. Populations of feral olives are also found in Western Australia, Victoria, New South Wales and south-east Queensland. There are no known populations of feral olives in Northern Territory and Tasmania.

Dispersal

Dispersal of olive seed is almost wholly dependent on birds. In South Australia, the Common Starling (Sturnus vulgaris) is the most prevalent disperser. A common sized flock of 100 could disperse thousands of seeds in a day. They usually swallowed olives whole, regurgitating the stones 20-50 minutes later. Most seeds were likely to be dispersed within 100 m of the parent trees. The exception was at dusk when starlings returned to nocturnal roosts, so that some seeds could be dispersed kilometres away from parent trees. Starlings had difficulty in handling and swallowing large fruits, and showed a strong preference for intermediate sized fruits. Many other birds have also been noted ingesting fruit and dispersing seeds of olives (Table 1). The European Fox (Vulpus vulpus) consumes olives and disperses seed in the southern Mount Lofty Ranges with seeds frequently found in fox scats during the winter months. Foxes may disperse olive seed up to 5 km away from the parent tree.

Impacts

A recent study (Crossman 2002) suggests feral olives have an impact on native canopy cover and diversity in native Eucalypt woodland. This comparative study (Crossman 2002) found that the dense cover of feral olive canopy coincides with reduced cover of native plants in heavily invaded woodland. Grey box eucalypt (*Eucalyptus macrocarpa* Maiden) upper-stratum cover and golden wattle (*Acacia pycnantha* Benth) mid-stratum cover was 80% and 75% lower, respectively, at a heavily invaded site (Crossman 2002). Native species richness and abundance were found to be significantly lower at the sites heavily invaded by feral olives. Species most at risk were herbaceous and shrub forms found in the lower- and mid-strata. Crossman (2002) reported that native plant species richness and abundance was more than 50% lower at one heavily invaded site.

Disperser	WA	SA	Vic	NSW	Qld	Tas
Pied Currawong			~	~	~	
Red Wattlebird	~	~	~	~	~	
Crested Pigeon	~	~	~	~	~	
Black-faced Cuckoo Shrike	~	~	~	~	~	~
Golden Whistler	~	~	~	~	~	
Silvereye	~	~	~	~	~	
Common Starling		~	~	~	~	~
Common Blackbird		~	~	~		
House Sparrow		~	~	~	~	

Table 1. Occurrence of common avian feral olive dispersers in southern Australia.

Risk Assessment

The risk assessment system for olives (APCC 1999) was designed as a decision tool for local government planners to rate the risk that a proposed olive orchard poses to native vegetation. The process has the potential to reduce the conflicts between the commercial use and conservation threats of olives. The scoring system had two criteria: 1) the likelihood of olive spread from the orchard, and; 2) the consequences of this spread. The likelihood criterion was split into two sub-criteria; non-management factors and management factors. The consequences criterion had factors considering the distance to significant native vegetation, the presence and control of feral olives, and the presence of existing orchards. A risk rating was determined by simply adding the likelihood and consequence scores. Local government planners were recommended to reject planning approval for orchards posing very high risk. For high risk orchards, compulsory management conditions to limit seed dispersal were recommended as a condition of approval, or the approval could be denied. For **medium** risk orchards, a voluntary land management agreement or a memorandum of understanding between local government and the grower was advised, to encourage compliance with an industry code of practice on minimising seed dispersal. Local governments are not currently legally obliged to use the olive risk assessment system but many have voluntarily done so.

Control

Olives have a tremendous capacity for regrowth following physical damage. As a result herbicide control is the most widely used technique. The recommended herbicide is Triclopyr which is usually mixed with diesel and applied to cuts made in the trunk of trees near the ground. Glyphosate is preferred for treatment of feral olives in and near watercourses due to the risk of off-target damage. Follow up treatment within two years is usually necessary to retreat trees and monitor regrowth. Trees partially killed may lay apparently dormant after initial treatment and then densely resprout. Seedlings are best grubbed from the soil when soil moisture levels are high. A soil seed bank and continual seed dispersal ensures that seedlings will continue to germinate at a treated site. Regular follow up treatment is integral to successful control. Alternative application techniques involve either 1) felling trees and then frilling the stump with an axe with herbicide applied to the fresh vertical cuts or 2) drilling holes into trunk near the ground and filling the holes with herbicide. It can cost up to \$15,000 per hectare to remove a dense infestation of feral olives.

APCC, 1999. Risk Assessment and Management of Olives. Animal and Plant Control Commission, South Australia.

Crossman, N.D., 2002. The Impact of the European olive (*Olea europaea* L. subsp. *europaea*) on grey box (*Eucalyptus microcarpa* Maiden) woodland in South Australia. *Plant Protection Quarterly* 17, 140-6.



One of the beautiful fairways at Pennant Hills Golf Course

Subscriptions

The Treasurer advises that subscription notices will be sent out over the next month. Please pay promptly to maintain your membership.

Papers from the September Seminar -Poisonous and Allergenic Plants

[4] POISONOUS AND ALLERGENIC PLANTS – WHERE ARE THEY?

Ros Shepherd Weed Society of Victoria PO Box 987, Frankston 3199.

Most plants have developed some form of defence mechanisms to survive the browsing effects of animals, such as thorns in roses or urticating hairs as in stinging nettles. However many plants have evolved a chemical defence against the animals and insects that are their natural predators, and these plants include many of the 'pretty' plants grown in gardens.

Poisonous plants are usually only poisonous to humans if consumed in large quantities, and often only if eaten by young children. Some of our food crops are poisonous if eaten uncooked, the process of heating renders some of the poisonous substances less harmful.

Many plants have showy flowers or vegetation which has become favoured by gardeners, however this sort of display often evolved as a warning signal that the plant may have other properties. The showy scarlet autumn foliage of *Toxicodendron succedaneum* is a good example as are the seeds of *Abrus precatorius*.

What are poisonous plants?

Poisonous plants cover all plants forms, from bulbs to trees, from common garden plants such as *Nerium oleander* to the less common *Convallaria majalis* and *Kalmia latifolia;* they include garden escapes such as *Gloriosa superba* and *Ligustrum*



Ros Shepherd

lucidum and common weeds such as *Moraea flaccida* and *Conium maculatum*. Not all poisonous plants are introduced, there are a number of species of *Cycas* that are common garden plants, whose seeds are poisonous and carcinogenic, while many plants encountered in the bush either have stinging hairs such as *Dendrocnide excelsa* or poisonous seeds such as *Abrus precatorius*, one of Australia's most poisonous plants, whose seeds are only poisonous when ingested crushed rather than whole.

Poisonous plants can be categorised as Very poisonous, Poisonous, Allergenic and Irritants, and in some cases a plants can contain chemicals for more than one category, thus *Ranunculus scleratus*, known as poison buttercup, is considered very poisonous as well as an allergenic and an irritant plant. In many cases all parts of the plant are considered poisonous, especially the fruit, but in many cases the roots, as in *Helleborus* species, and tubers, for example the corms of *Iris* species and green potatoes are poisonous.

Chemicals in plants

Plants belonging to the same genus usually contain the same chemical properties, thus *Solanum* species mostly contain the glycosides solasonine, solamargine and

solanine and the alkaloids solasodine and solasodamine while some species have a more specific alkaloid such as soladulcidine found in Solanum dulcamara. The families Apocynaceae and Thymelaeaceae contain a number of plants that are considered to be very poisonous, the most common genera in Apocynaceae being Allamanda, Casacabela, Neium and the South African Acokanthera, used by some indigenous people to poison their arrows, and Strophanthus speciosus, another South African plant extremely poisonous but rather rare; and in Thymelaeaceae the commonest garden plant is Daphne. The toxins of Apocynaceae vary and include cardiac glycosides mainly olerandrin and neriin while the cardiac glycosides in Thymelaeaceae are mainly ouabain, strophanthin, inceine and acocantherin.

Some garden plants are considered fatal, but are not very common in Australian gardens, Strophanthus speciosus, Oenanthe crocata, hemlock water dropwort, native of Europe which contains the toxins oenanthetoxin and terepene phellandrene, Veratrum albun, false hellebore, native of Europe and North Africa with the toxins helleborin, helleboracin, and a number of steroid alkaloids and Hyoscyamus niger henbane, native to central and southern Europe containing cyanides, and a number of tropane alkaloids including hyoscyamine, scopolamine, hyoscytricin and atrophine. Many gardens are removing these plants as they are considered so poisonous.

Symptoms

Most of the symptoms of poisoning by plants are nausea, vomiting, dizziness, weakness, headache, often abdominal pain and diarrhoea. And then recovery. However when very poisonous plants are concerned these symptoms continue and develop into an irregular pulse, difficulty breathing, fever, disorientation, convulsions and even coma and death from heart failure and respiratory paralysis. Death is the extreme case scenario and is not very common. To get to this stage a person has to usually ingest a large amount of the specific part of the plant that is poisonous; usually this does not occur, rather a child eats part of the plant and feels sick.

There are however a number of plants that cause allergenic and irritant reactions, the symptoms being reddening and blistering of the skin, and allergic dermatitis, as with *Toxicodendron succedaneum*, also rashes which occurs with many plants that have a milky sap such as *Plumeria rubra*, frangipani. People who work in the cut flower trade are at risk from many of the plants they handle, a number of these are irritants and allergenic such as *Alstroemeria aurea* and most plants belonging to Liliaceae.

Conclusion

Even though some of the plants mentioned are considered poisonous or even very poisonous that is not sufficient recommendation for plants be removed from gardens. Plants should be treated with caution if poisonous, and the poisonous part removed carefully and disposed of. One garden show did recommend that all *Helleborus* species be removed as they are classified as very poisonous and the poisonous properties of Zantedeschia aethiopica have been included in a reason for that plant to be declared in Western Australia, however caution not panic is recommended when handling all garden plants.

Reference

Shepherd, R. C. H. (2004). Pretty but Poisonous – Plants Poisonous to People. An Illustrated Guide for Australia. R .G. and F .J. Richardson, Meredith, Australia.

[5] POISONOUS, PRICKLY, PARASITIC, PUSHY? -PRIORITISING WEEDS FOR CONTROL PROGRAMS

John Virtue

Senior Weed Ecologist, Department of Water Land & Biodiversity Conservation, South Australia and CRC for Australian Weed Management

There are around 3,000 plant species currently considered to be "weeds" somewhere in Australia. In addition, there are more plant species waiting to naturalise amongst the pool of around 27,000 exotic plant species that have been introduced to Australia (Virtue *et al.* 2004). With so many species it is clear that we need to prioritise weeds for control programs, whether you are working at the local, regional, state or national scale.



John Virtue

How to prioritise? There are two fundamental consideration s in deciding whether to embark on a control program for a particular weed.

Firstly, does

the weed pose a serious enough threat, or risk, to the economy, environment and/or society? Secondly, would coordinated control be feasible given the current status of the weed and the resources available to tackle it? The Cooperative Research Centre for Australian Weed Management (Weeds CRC) has sought to foster standardisation of the process of prioritising weeds, through the publication of a protocol on post-border weed risk management (WRM) in collaboration with Standards Australia (Anon. 2006). A logical, six step process has been developed, based on the Australia/New Zealand standard for risk management (AS/NZS 4360:2004):

- 1) *Establish the Weed Risk Management Context*. The context in which weed risk management is to occur is defined, by identifying goals, geographic and land use scope, stakeholders, existing policies and legislation, resources and the tangible outcomes and outputs sought from engaging in the WRM process. A representative steering committee is established to drive the WRM process.
- 2) *Identify Weed Risk Candidates*. Weed species candidates for detailed assessment are selected, from existing lists and new and potential naturalisations.
- 3) Assess Weed Risks. Comparative weed risks are analysed using the three key criteria of invasiveness, impacts and potential distribution. Invasiveness is a relative index of the rate of spread of a weed. Impacts are the economic, environmental and social effects of weeds. This is where poisonous and allergenic attributes are considered. Potential distribution is the total area at risk if a weed were to spread uncontrolled.
- Assess Feasibility of Coordinated Control. Comparative feasibility is analysed using the three key criteria of current distribution (i.e., how widespread the species is), costs of control (e.g., searching for the weed, accessibility, herbicide treatment) and persistence of the problem (e.g., seedbank longevity, tolerance of control measures, whether still cultivated).
- 5) *Determine Weed Management Actions*. Comparing weed risk versus feasibility

of coordinated control prioritizes and categorises weed species for various management actions. These actions include preventing entry, eradication, containment and development and extension of targeted control techniques.

6) *Implement Weed Management Actions*. This is the transition from planning to doing, with specific actions implemented for priority weeds.

Weed Risk Assessment Systems

The post-border WRM protocol (Anon. 2006) does not prescribe a particular prioritising weed risk assessment (WRA) system, but rather details the essential elements that should be addressed in such systems. There are several prioritising WRA systems in use in Australia, developed in South Australia, Victoria and Queensland. Separate to these is the "Weed Risk Assessment System" (Pheloung et al. 1999), which is used to predict potential weediness at Australia's border. The original weed prioritising system in Australia was that developed for Weeds of National Significance (WoNS) (Thorpe and Lynch 2000, Virtue et al. 2001).

The WoNS process had the key criteria that are given in the post-border WRM protocol (Anon. 2006), but did not keep risk and feasibility scores separate. Economic, environmental and social values were also considered but data was difficult to obtain for some species/criteria. There was a specific impacts question "Does the weed adversely affect the health of native and/or domestic animals due to physical injuries, poisoning or allergenic reactions?", which would have contributed to parthenium weed, Parthenium hysterophorus, and lantana, Lantana camara, becoming WoNS due to their toxicities.

The South Australian Weed Risk Management System (Virtue 2004) seeks to avoid problems with valuation by determining priority weeds within different land uses. Human health impacts are of most concern in the urban landuse, whilst livestock poisoning issues are most relevant to the grazing landuse. The system has a simple additive/multiplicative scoring system for weed risk and feasibility of containment and has been applied at the state and regional levels in South Australia.

References

- Anon. (2006). HB 294-2006 National Post-Border Weed Risk Management Protocol. Standards Australia. International Ltd., Sydney, Standards New Zealand, Auckland and CRC Australian Weed Management, Adelaide. 75 pp.
- AS/NZS 4360:2004 Standards Australia/Standards New Zealand (2004). Risk management. Third Edition. Standards Australia International Ltd, Sydney, Standards New Zealand, Wellington and CRC Australian Weed Management.
- Pheloung, P. C., Williams, P. A. and Halloy, S. R. (1999). A weed risk assessment model for use as a biosecurity tool evaluating plant introductions. *Journal of Environmental Management* 57, 239-51.
- Thorpe, J. R. and Lynch, R. (2000). The determination of Weeds of National Significance. National Weeds Strategy Executive Committee, Launceston. <u>http://www.weeds.org.au/docs/WONS/</u>
- Virtue, J. G. (2004). SA Weed Risk Management Guide. Department of Water Land and Biodiversity Conservation, Adelaide, South Australia. http://www.dwlbc.sa.gov.au/biodiversity/pests/weeds/plants.html
- Virtue, J. G., Bennet, S. J. and Randall, R. P. (2004). Plant introductions in Australia: How can we resolve "weedy" conflicts of interest? Proceedings of the 14th Australian Weeds Conference. Eds. B. M. Sindel and S. B. Johnson. Weed Society of New South Wales Inc., Sydney. pp. 42-48.
- Virtue, J. G., Groves, R. H. and Panetta, F. D. (2001). Towards a system to determine the national significance of weeds in Australia. *In* 'Weed Risk Assessment', Eds. R. H. Groves, F. D. Panetta and J. G. Virtue. CSIRO Publishing: Collingwood, Victoria. pp. 124-152.

[6] ASTHMA WEED EDUCATIONAND INCENTIVES PROJECT

Sue Stevens Asthma Weed Project Officer Randwick City Council

Asthma Weed is a serious noxious weed in the Sydney Metropolitan region. Known botanically as *Parietaria judaica*, Asthma Weed is also known as Sticky Weed, Pellitory and Kirribilli Curse. This weed can grow just about anywhere and in any conditions. It is common in urban bushland, gardens, lane ways and in brick and rock walls.

Asthma Weed is related to stinging nettles, and the sticky hairs on the plant's leaves and stem may produce a skin rash in sensitive people who come into contact with the plant. The pollen of Asthma Weed may also trigger hay fever, conjunctivitis, rhinitis and asthma. This problem is magnified by the fact that Asthma Weed can flower most of the year. The plant's ability to flower most of the year in Sydney also contributes to its ability to spread and invade new areas rapidly.



Sue Stevens

Asthma Weed is a perennial herb that grows to approximately one metre high. It has soft green, ovalshaped leaves with pointed ends, 2 cm to 8 cm long. Leaves are arranged alternately along pink or red stems. Flowers are very small, light green in colour, and clustered along the stems. Flowers, leaves and stems are covered with fine sticky hairs that will stick to skin, clothing and animal fur. Roots are red and woody on older plants. Seeds are dispersed by wind, water and by attaching to clothing, animal fur, and in soil and mud attached to machinery.

An Asthma Weed Education and Incentives Project is currently underway in the Sydney Metropolitan region. The project aims to increase the community's identification and awareness of Asthma Weed and to assist residents to remove any plants on their properties. The project involves a range of strategies, including:

- educational displays at various locations around Sydney,
- media releases,
- posters,
- road signs,
- training workshops for council staff and residents,
- distribution of brochures, bookmarks and flyers by councils, and
- the distribution of Asthma Weed Incentives Kits to residents.

At the same time, all the councils involved will continue their strategic Asthma Weed control programs on public land. Eighteen Councils in the Sydney region are currently targeting <u>Asthma Weed</u> through this project.

The Asthma Weed Project has received funding assistance from the Natural Heritage Trust (NHT) through the Sydney Metropolitan Catchment Management Authority (SMCMA) and Sydney Weeds Committees.

[7] WEED PROOFING AUSTRALIA: A WAY FORWARD ON INVASIVE GARDEN PLANTS

Andreas Glanznig, Senior Policy Adviser, WWF-Australia

Australia has the challenge of working out an effective, least cost solution to tackling the invasive garden plant problem – which accounts for 70% of Australia's environmental and agricultural weeds. We have a superb opportunity to work out this solution in a strategic and systematic way so that that all stakeholders go into a change process with their eyes open and are able to participate in an ordered transition.

The starting point is the need to recognise that most garden plants in trade have no weed history and can be considered environmenta lly safe. This creates an



Andreas Glanzig

opportunity to encourage a transition of the garden plant market towards the majority of low risk plant species.

Many garden plant species currently being traded, however, are or have the potential to cause serious harm to farmers, the agricultural industry, areas of high conservation value and the broader environment. In short, these invasive plants present a clear strategic risk to Australia's agricultural profitability and our natural assets, and as such warrant concerted action by governments, industry and the community to mitigate this risk and facilitate a transition toward a prosperous garden plant market based on low-risk plants.

It is important to also recognise that the existence of these high risk plants in Australia's garden plant market is a legacy of Australia's quarantine regime that existed before the mid-1990s that focussed on contaminants and a relatively small number of serious agricultural weeds. These plant species would not be able to be legally imported into Australia today. A policy package is needed that strives to achieve a 2015 vision of a prosperous garden industry built on the sale of low-risk garden plants, encouraged by an empowered and enabled community that wants to reduce their weed spread risk footprint. The policy package needs to deliver the following outcomes by 2010:

Environmental

- Only new low risk plant species are legally permitted into Australia by 2006
- No high risk garden plants are traded, focussing on those yet to naturalise or become widespread
- Increase in detection and eradication of new high risk garden plant incursions

Social

- Australians are empowered and enabled to reduce their weed spread risk
- In major cities and towns, individuals able to join communityexpert networks to detect and eradicate new high risk garden plant incursions
- Garden industry supports, and is enabled to play a significant role in reducing Australia's weed spread risk

• Garden plant species that present a high risk of demanding significant Australian community group effort to restore bush and land are removed from sale

Economic

- Garden plant species that present a high risk (and potential and/or actual cost) to Australia's agricultural industries are removed from sale
- Garden plant species that present a high risk (and potential and/or actual cost) to government agencies responsible for managing national parks and other crown lands are removed from sale
- Garden businesses unduly financially impacted by the policy receive one-off transition reimbursement where appropriate (i.e. significant loss in market value of existing Plant Breeder Rights)
- New market demand created for low-risk garden plants.

This can be achieved through a **10 point policy package**:

- 1. Close Australia's front door to new weeds
- 2. Give garden industry and communities certainty about the weed status of garden plants
- 3. Better understand the extent and risk from continued trade in invasive garden plants
- 4. Build knowledge about sterile garden plants and the dynamics of invasiveness
- 5. Build garden industry understanding about the risks and costs associated with invasive garden plants, and capacity for positive action
- 6. Mobilise the garden industry to respond positively to the invasive species challenge
- 7. Protect garden industry leaders and reduce transaction and compliance costs by establishing a streamlined national regulatory framework
- 8. Phase out supply and trade of high risk invasive plants nationally
- 9. Encourage gardeners to increase product demand for low risk garden plants
- 10. Mobilise communities to search and destroy new infestations of escaped invasive garden plants



Fancy hat parade - weed walkers at the AGM

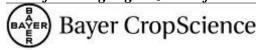
Unless otherwise acknowledged, all photographs in this edition of A Good Weed were provided by Laurie Greenup and Michael Hood

A Good Weed #41 February 2007

A Good Weed	
The Newsletter of The Weed Society of New South Wales PO Box 438 Wahroonga NSW 2076	POSTAGE PAID AUSTRALIA
Print Post Approved PP247134/00010	



The Weed Society of New South Wales acknowledges the generous support of the following organizations for their sponsorship of the Society and this Newsletter



Luhrmann Environmental Management Pty Ltd providing quality solutions

