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Weedscene

Newsletter of the Weed Society of Victoria Inc. May 2003

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The Weed Society of Victoria presents its FIRST BIENNIAL CONFERENCE 20–21 August 2003

Developments in Weed Management

at the All Seasons International Hotel, Bendigo

The aim of this series of conferences is to provide weed managers in Victoria, who would not normally be able to attend the Australian Weeds Conference, with a venue where weed issues relevant to Victorian conditions can be discussed. This event will be held every two years and is destined to become a major WSV initiative.

This conference will be divided into four sessions.

The first, **Environmental Weed Management,** will examine the basis of environmental weed management including the development of weed management plans, the importance of mapping and the necessity of record keeping. The methods for the discovery of **New Weed Incursions** will be discussed in the second session. Weed identification is a key to discovery and is essential to weed management. What weeds are there, how do we discover new weeds? Weed Alert – the system for discovering new weeds, its performance and preliminary results will be described. **Weed Control Technologies** are central to weed management. What are the advantages and drawbacks the available weed control techniques including mechanical, cultural biological and cultural techniques? The last session, **Integrated Weed Management,** will examine the underlying principles of integrated weed management and how IWM can enable more efficient and sustainable weed control.

The format of these sessions will be based on invited presentations from key speakers who will provide a basic introduction to a topic. Conference delegates will then be able to discuss the topic under the leadership of the session Chairman. Delegates are also invited to bring posters for discussion purposes. A poster summary will be included in the proceedings.

A brochure with registration form is enclosed with this copy of Weedscene. If you need additional brochures or forms, or need more information, either visit the Society website at http://www.vicnet.net.au/~weedsoc/ or call Bob Richardson on 03 5286 1533.

Roads Open Up Paths for Weed Invasions

Two new studies find that roads have a considerable impact on the spread of invasive species. The studies, conducted by researchers at the University of California at Davis (UC Davis), find that improved roads in wilderness areas spread more invasive weeds than primitive roads and that roadless areas act as refuges for native species against invasions.

The studies document that roads promote invasion because vehicles can transport non-native seeds into uninfested areas, and disturbed roadsides give weed seeds a place to grow.

'Our findings show that roadless habitats have multiple benefits, not just for the environment, but also for the economy and our quality of life,' said Jonathan Gelbard, a UC Davis doctoral candidate and co-author of both studies. 'They are not only refuges for native biodiversity, but also protect against non-native weed invasions, which are costly for ranchers and public agencies.'

One of the UC Davis studies, published in *Conservation Biology*, is an examination of 42 roads in and around Utah's Canyonlands National Park. Gelbard and research ecologist Jayne Belnap of the US Geological Survey found that each step of road improvement converted an increasing area of natural habitat to roadside habitat, from which non-native weeds spread into adjacent natural ecosystems.

The second study, published by Gelbard and UC Davis professor Susan Harrison in the journal *Ecological Applications*, explores the effects of roads on inland California foothill grasslands. It found that in areas with typical grassland soils, non-native plants were less abundant and native plants more abundant at sites about a half-mile from roads compared to sites less than 33 feet from roads.

In this issue…

DNA – closing the net on a thorny villain

DNA fingerprinting is being used to catch and fight a villain that terrorizes 8.8 million hectares of Australia's natural and agricultural environments – blackberry.

A joint project between the Cooperative Research Centre for Australian Weed Management (Weeds CRC) and the Department for Environment and Heritage in South Australia, is using DNA fingerprinting to understand the taxonomy of blackberry. There are at least 14 different, but closely related species known as European blackberry in Australia. Making matters worse, hybridization between the species is common. As a result, telling one species from another is very difficult – until now.

The use of DNA fingerprinting now complements current studies into the way in which leaves, flowers and other plant features vary between the species, and has enabled scientists to better understand the weed. 'We cannot control a weed effectively and efficiently if we do not know which species we are dealing with', said Weeds CRC scientist Dr. Kathy Evans.

With this better understanding of blackberry, Australian scientists in Adelaide, Hobart, Canberra and France are working to improve the selection strategies for new rust strains to help control this thorny villain. The new challenge is to develop a way for field-workers to identify which species of the villainous blackberry they are dealing with, a prerequisite for choosing the best control method.

DNA field identikits are still a dream, so the botanists of the Department for Environment and Heritage are developing a computer-driven, user-friendly way to identify blackberry species in the field, without the need for DNA testing. This visual guide will be a valuable tool for land managers, community groups and landholders, helping to close the net on one of Australia's Weeds of National Significance - declared noxious in six States.

Dr. Bill Barker of the Department for Environment and Heritage is leading this team of scientists. 'The first version of this tool looks like fulfilling all our hopes of making identification much easier. When the final product is launched on CD and on the Web it will also make identifying and finding out about blackberries far more accessible than in the past', he said. It is expected the resource will be available next year, following trials with environmental and weed workers across southern Australia.

For further information contact Dr. Kathy Evans or Dr. Bill Barker, CRC for Australian Weed Management Department for Environment and Heritage, SA.

Rational Weed Management in Cotton

The Australian Cotton Cooperative Research Centre (Cotton CRC) now offers WEEDpak, a comprehensive, practical guide for integrated management of weeds in cotton. The on-line resource has been compiled and distilled from more than a decade of research, and presents detailed information for more than 200 weed species. The material concentrates on integrated weed management and touches on a number of contemporary issues such as herbicide resistance, careful attention to field hygiene, and crop rotation, among others.

Cotton CRC's executive officer noted that, 'The suite of integrated weed management principles outlined in the WEEDpak Guide will facilitate reduced dependence on herbicides, improve environmental management, lower costs, and lead to more sustainable weed control'. While obviously established for Australian conditions, the presented information has much wider geographic usefulness and, though formally introduced recently, establishes a flexible body of information that can be readily updated as warranted. The WEEDpak project can be found at: http://www.cotton.crc.org.au/Pulicat/Weeds/index.htm. ***IPMNet No. 112***

Abrade and Wipe

Devices that directly apply non-selective herbicides to weeds (so called 'weed wipers') have been on the market in numerous configurations for well over a decade. A relatively recent variant introduces a wrinkle in that the surface making contact with the targeted weed is rigid and covered with grit that abrades or scores the weed's exterior as it passes by. The abrading action inoculates the weed with herbicide and thus ensures a more effective impact on the plant. A 12-volt system, tank fed, high pressure metering pump, and delivery tubing distributes viscous liquid herbicide to the application surface along a corrosion-resistant, grit-covered high strength beam or tube. The patented system is normally drip-free, unaffected by sloping ground surfaces and not subject to becoming clogged by foreign matter. Applicators can vary in length, be positioned on vehicles to suit conditions, and can be easily mounted and dismounted.

J. Moore, Weed/Sweep Systems, USA. Email: mailto:WeedSweep@cs.com, website: http://www.weedsweep.com.

IPMNet No. 112

The Web-based Pasture Species Database

If you are seeking information on pasture species and cultivars, you may find a visit to the Grassland Society of Victoria Inc web site at http://www.grasslands.org.au useful. On this web site, you can access the pasture information by clicking on the Species Guide on the top menu bar then select Pasture Species Database from the drop-down menu.

At the species level, the database provides information on sowing rate, growth habit, rainfall requirements, stock problems, and response to acidity, fertility and grazing on 37 species. At the cultivar level, the data base provides information (where the data is available) on flowering date, seed characteristics, disease resistance within species, the response to climate and soil conditions, growth potential, seasonal distribution of growth, management requirements and animal health issues on over 200 cultivars.

Weed Report: *Melbourne International Flower and Garden Show 2003*

2–6 April 2003, Royal Exhibition Building and Carlton Gardens, Melbourne

Yesterday, Michael Hansford and I (Department of Primary Industries, Victoria) visited the Melbourne International Flower and Garden Show 2003 (MIFGS). MIFGS is the largest flower and garden show of its type in the Southern Hemisphere, has over 300 exhibitors and an expected 125 000 visitors.

We were recording some of the more serious weeds being promoted, sold and displayed in the stalls and exhibits. This is just a brief summary of some of the things we found.

The spellings used here largely reflect the spelling used on the plant labels so may not be botanically correct. Generally, the use of botanical names on plant labels was very poor. Many variety names were used which had no botanical meaning. The most common group of plant material with no or very little use of botanical names was bulbs.

Thank goodness, this year we did not see any *Nassella tenuissima* (Mexican feather grass) as I had in previous years.

Equisetum spp. (horsetail) was seen in a Silver Medal Award Winning exhibit. This landscape exhibit of a courtyard included maybe 160 pots (depending on pot size) of *Equisetum* spp. (either *E. arvense* or *E. hyemale*) used along its edges and mulched into retaining walls. The plants were up to one metre tall. This use of *Equisetum* is often seen in overseas landscaping and gardening books / magazines available in Australia. A stall selling exotic foliage plants was selling two types of *Equisetum* spp. The smaller, finer leaf and multi-branched *Equisetum* was being sold in small tubes for $6 each or 4 for $20 and was called New Water Fern. *Equisetum* is considered one of the World's Worst Weeds, is prohibited entry to Australia by AQIS, prohibited in all States (except NT and Vic), banned in NZ, is toxic to livestock and very invasive. It is about to be declared in Victoria.

Pistia stratiotes (water lettuce) was very common as a floating water plant in exhibits and for sale. It was used to decorate water surfaces in various ponds and ceramic pots / bowls. Usually sold for $2 per plant or 3 for $10. Lots of people were seen walking around carrying their purchased plants in plastic bags like goldfish. It is not a declared plant in Victoria, but is so in other States.

Houttuynia cordata (chameleon plant, court jester, houttuynia) is a creeping groundcover with multi-coloured leaves. It spreads by underground stems. It is banned in NZ and was very common at MIFGS as display plants and for sale. It has been seen in previous years at MIFGS but was more common this year.

Oxalis hirta (shamrock hirta) was seen for sale. Many *Carex* species were popular as in previous years in displays and for sale. Species and varieties include *Carex petriei*, C. Frosted Curls, C. Comans Bronze, *C. morrowii* Variegated, *C. testacea*, *C. buchananii*, Blue Carex (no botanical name), *C. albula*, *C. brunnia* variegata.

Succulents (e.g. *Aloe*, *Agave*, *Sedum*, *Kalanchoe*, *Yucca* etc.) and cacti proved very popular as in recent years. There was a greater emphasis this year on low water-use gardens. It is suspected that we will see lots more succulents in coming years becoming naturalized.

Juncus effusus 'Spiralis' was for sale in a number of stalls, as it was last year.

Invasive and suspect grasses include *Miscanthus sinensis*, *Calamagrostis* spp., *Oryzopsis lessoniana*, *Phalaris tricolor*, *Phalaris arundinacea* 'Picta', *Pennisetum setaceum* (very common), *Pennisetum alopecuroides* (common and not native to Victoria), *Pennisetum clandestinum* (Kikuyu), *Stenotaphrum secundatum* (Buffalo Grass),

Commonly sold invasive or suspect bulbs included *Ixia* spp., *Sparaxis* spp., *Scilla* spp., *Ipheion* spp., *Freesia refracta alba*, *Watsonia* Lilac Towers, *W.* Ivory Towers, *W. ardenii* Violet Towers, *W.* Violet, *W.* White, *Leucojum* sp. (Snow Flakes), *Narcissus* spp. (Daffodils and Jonquils – largely not very invasive), *Muscari* spp. (Grape Hyacinth), *Iris fimbriata*, *Lilium tigrinum*, *Schizostylis alba* (White Kaffi Lily), *Sisyrinchium* × *bermuderianum* (Amber Stars), *Crocosmia masonorum*, *Tritelia* spp., *Tritonia* spp., *Tritonia lineata* (pink), *Tritonia crocata*, *Lachenalia mutabilis*, *L. pallida*, *L. aloides* quadricolor (Soldier Boys), *L. aurea*, *Babiana* spp., *Babiana stricta*, *Gladiolus* spp. (Painted Ladies, Blushing Bride, roseus, Oriental Lady), *Bomarea caldasii* (Climbing Alstroemeria – need to do some homework on this one), *Alstroemeria* spp., *Tulbaghia* spp. (Society Garlic), *Zantedeschia aethiopica* (Arum Lily – far less than in previous years), *Amaryllis belladonna* (Belladonna Lilies), *Ornithogalum nutans*, *O. arabicum* (Black Pearl Lily, Arabs Eye), *O. conium*, *O. umbellatum* (Star of Bethlehem), *Allium sphaerocephalum*, *A. moly*, *A. giganteum*, *A. christophii*, *A.* Globemaster.

Geranium spp. (particularly the small ground covers) and *Euphorbia* spp. were again popular this year with many species and varieties being sold.

Other potential and invasive plants included *Melianthus major* (less this year than in previous years), *Dietes bicolor*, *Cornus capitata* (Dogwood), *Centaurea nigra* ssp. *rivularia* (Rose Cornflower), *Centaurea dealbata* (Purple Cornflower), *Gazania* spp., *Lupinus* sp. (Russell Lupin), *Agapanthus praecox*, *Asclepias physocarpa* (Swan Plant), *Selaginella martensii*, *Olea europaea* (Olive), *Erigeron karvinskianus* (Seaside Daisy – less than in previous years), *Erica melanthera* (less than in previous years), *Achillea* 'Credo', *Kniphofia* spp., *Arbutus unedo* (Irish Strawberry), *Hedera helix* (English Ivy), *Nandina domestica*, *Gloriosa superba*, *Schinus areira* (Peppercorn Tree).

Suspicious plants that need some more homework include *Kalanchoe diagremontiana* hybrid (Piggy Back), *Amaranthus* sp. (with big trailing red flower stems), *Scirpus* sp. (Fairy Lights), *Cyperus papyrus* (Fairy Wands), *Physalis* sp. (The Lantern Plant), *Echium virescens*, *Echium fastuosum*, numerous *Salvia* spp., *Ampelopsis elegans* (Rainbow Creeper – variegated climber with blue berries), *Helichrysum petiolare*, *Serratula* (looks like a small flowered *Centaurea*).

This is just a snapshot of what we saw – remember that the spellings and names largely reflect those on the labels.

Kate Blood, Project Leader, Weed Alert Rapid Response

Soil Incorporated – Pre-emergent Herbicide Application

The majority of pre-emergent herbicides inhibit seed germination or root growth, others inhibit shoot emergence at the surface. For accurate pre-emergent spraying, adequate incorporation is vital in most cases to avoid volatilization of the herbicide. Incorporation typically involves dragging harrows behind the sprayer, but depending on the herbicide used, the spraying, seeding and incorporation of the chemicals (and in some cases, the application of liquid fertilizers as well) can be done in one pass, significantly reducing traffic over the paddock.

This requires spray equipment to be fitted to the seeder, and careful consideration must be given to the nozzle design and capacity, especially given the low ground speed and non-typical nozzle spacing and height. To avoid crop damage and maximize effectiveness, the herbicide should be placed in the top two to three cm of soil while the seed should be placed below this layer.

A coarse drop size will typically be required, significantly reducing the potential for spray drift. Nozzles such as the Turbo TeeJet (TT), Air Induction (AI), Drift Guard (DG), Turbo FloodJet (TF) and Full-Jets (FL) operated at lower pressure will achieve coarse droplets appropriate for soil incorporation. The Extended Range (XR) nozzle can be used, but at lower pressures of 1-2 bar.

For good results nozzle pressure and spacing must be uniform, and the nozzle should operate at the proper height above the soil. Ground speed should remain constant, unless using a spray controller. Pre-emergent sprays will not be efficient in paddocks containing a large number of well established weeds because the large weed leaf canopy can reduce the effectiveness of incorporation, and the mature plants are unlikely to be killed.

TeeJet Solutions, Geelong

Sweet Vernal Grass is Not So Sweet

by Kevin Reed, DPI, Pastoral and Veterinary Institute, Hamilton

Sweet vernal grass *(Anthoxanthum odoratum)* is a perennial with outstanding adaptation and persistence and is a common grass in unimproved pasture in southern Victoria. Indigenous to Europe, Asia, and north Africa, sweet vernal grass was introduced into Victoria sometime prior to 1887. It is most common in moderate to high rainfall districts and will grow on a wide range of soil types. It is efficient at finding nutrients and is often a dominant species in paddocks where potassium is deficient and grazing pressure is low. In a species survey of 293 random pastures carried out in south-west Victoria in spring 1989, Paul Quigley (DPI) found that 47 pastures (16%) contained sweet vernal grass. The content of sweet vernal grass ranged up to 36% (dry matter basis). For the 47 pastures, the mean content of sweet vernal was 11%. Its nutritive value is low, as feed tests of hay undertaken by staff at the Pastoral and Veterinary Institute have demonstrated.

It is not particularly difficult to control sweet vernal grass. Graze down hard, soil test and prepare a comprehensive fertilizer program that will ensure strong, vigorous growth of the newly sown or direct-drilled perennial grass and clover pasture.

Dicoumarol poisoning

Sweet vernal grass, sweet clover (*Melilotis alba*), and 161 species of Umbelliferae (e.g. giant fennel (*Ferula communis*)) are examples of herbage species that contain coumarin. Coumarin can be converted to dicoumarol by dimerization and oxidation through the action of fungal mould species, including *Aspergillus*, *Penicillium*, and *Mucor*. This conversion to the toxic metabolite occurs when the conditions at hay curing or ensilage favour fungal growth (for example, excess moisture or aerobic conditions). Dicoumarol toxicity is a rarely reported disease in livestock, but it has been reported in cattle fed hay or silage made from sweet vernal grass in England, Australia and in the United States of America. Coumarin is used as a drug in anticoagulant therapy.

Adapted from the Grassland Society of Victoria Newsletter

'Grassland Farming – Rocket Science'

The Grassland Societies of Victoria and NSW are holding their Joint Annual Conference on 11–13 June 2003 in Albury, NSW. What does the future hold for grassland farmers? Come and find out what science has in store and how this will affect our farming in the future. The Societies have invited leading scientists to review the major primary-producer funded projects from the last decade. They want the key findings on grassland farming – one session reviewing millions of dollars of research. Don't miss this special chance!

For further information contact the Grassland Society on 03 5974 4066.

Obituary

Leon Smith, founding member of the NSW Weed Society, has sadly passed away. Leon was an active member of the Society for over 30 years and served as President, NSW delegate to the Council of Weed Science Societies, and from 1992 to 2002, secretary. Leon was also President of the International Weed Science Society for several years. He received a number of awards over the years including the CAWSS medal in recognition of his outstanding contribution to weed management in Australia. In November 2002 the NSW Weed Society awarded him Life Membership in recognition of strong leadership and highly distinguished service to the Society.

WSSV HOME PAGE: http://www.vicnet.net.au/~weedsoc/

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