



Paul's Piece

Hello and welcome again to all readers of the Grassy Gazette. It's time again for putting my thinking cap on. While this is generally a challenge, it's also a reminder of what a great pleasure it is to be contributing to this grassland-focused newsletter. It means we are still battling way on various fronts trying to restore threatened grassy plant communities.

This issue will highlight a number of interesting activities, which include continuing findings our original Grassy Groundcover sowings, various consolidations at Seed Production Sites, brand new projects some really interesting new student experiments, and wait for it, a visit to our Hamilton site by the Governor of Victoria, Professor David de Kretser and Mrs de Kretser.

I realize that just about every time I put together a 'Pauls Piece' I marvel what a great bunch of people that I've had the pleasure to work alongside as part of the GGRP. I can safely say this has not changed a jot now five years down the track. Happily we still work closely with many of the original GGRP 'crew', and this group has grown several-fold over the years with the initiation of new projects. There is a bit of science behind this "grassland restoration thingie", but I am absolutely convinced there is as much or more 'people power' involved in just about every positive outcome. So, on that note, I think we should launch into this current edition

Glenelg Highway/ Wickliffe Grassland Restoration

Since last year we have been working on an exciting new project with Frank Carland and Natasha Kennedy from Vic Roads at two sites on the Glenelg Highway, 3km and 5 km respectively west of the township of Wickliffe in Victoria's Western District. At these two sites, plantations of introduced native trees and volunteer *Pinus radiate*, were removed in 2006 & 2007

Frank and Natasha feared that subsequent germination of herbaceous weeds (e.g. brown top bent, phalaris, fog grass to name a few of many), and re-growth of woody introduced Acacia and Callistemon would threaten/invade adjoining areas of high quality grassland. After considering locking in to a cycle of annual weed spraying (which we considered would be unlikely to properly control such a vigorous and diverse group of weeds species), we decided to proceed with a combination of GGRP methods (having sought and been granted EPBC and FFG approval).



Soil works being undertaken to remove weed loads prior to direct seeding at Wickliffe



In May we scalped the degraded areas to remove the soil seed bank of environmental weeds. It is worth noting that the soil works were undertaken in a most professional and thorough manner by the contractors. This was especially relevant because of the close proximity to remnant grassland populations. My thanks go to the grader and truck drivers for their excellent work in this respect. This spring we will direct sow both sites using locally sourced grassland species. In some cases (as with the EPBC-listed Hoary Sunray (*Leucochrysum albicans* var. *tricolor*) and Button Wrinklewort (*Rutidosus leptorhynchoides*), plants were propagated as grown as a seed crop in seed production by long-time GGRP SPA wiz David Franklin (and offsider Ron).

As many of you know, there are many significant grassland remnants on VicRoads managed roadsides throughout the state. We (Frank and I) hope to demonstrate our GGRP methods of direct seeding grassland species might be a viable means for future grassland rehabilitation of selected Vic Roads sites that will result in high level environmental benefits as well as reducing future maintenance costs.

But wait there's more!

It is also worth noting that we have also recently been asked by the Pyrenees Shire to rehabilitate (by direct seeding) some small sections of roadside following road widening works. In this instance we will look to return phalaris dominated areas to native grasses.

Another development has come about through some kitchen table discussions between David Franklin and myself, musing about other opportunities for direct seeding of grassland flora. David being the man of action that he is, then followed this up with phone calls. Before we knew it, discussions and visits to David Hermans GGRP site at Moyston with representatives of Great Western Winery, have resulted in the upcoming implementation of a trial sowing of native grasses and wildflowers at one of their vineyards.

Both these developments are very exciting for all parties, and we hope will further demonstrate the value of indigenous herbaceous vegetation. Both projects are in the early stages and I'll report further developments in future Grassy Gazette issues.

Werribee Plains Vision funding

Our GGRP project list took another boost recently when it was announced that Greening Australia and the Werribee Open Range Zoo (with other partners include Melbourne

University, Sustainable Gardening Australia and Friends of the Zoo) where successful in receiving funds as part the State Governments 'Werribee Plains Vision' program. Over the next three years we'll be promoting education about native grasslands in 36 schools in the Werribee Plains region, establishing a containerized seed nursery for future zoo and regional grassland projects and expanding the area of grassland previously directed seeded by GGRP methods within the Zoos 'Basalt Plains' display. Most readers will know that grasslands to the west of Melbourne and in the Werribee region are under increasing pressure from urban sprawl (considering proposed new urban growth boundaries). This has seen the decimation many grasslands which are home to threatened mammals, birds, reptiles, amphibians, insects and plants. This project will help to educate young children about the plight of these communities and raise their profile to Zoo visitors by showing through our sown communities how wonderful and diverse they can be.

More Critters to report moving into GGRP homes!

For some time now I've been suggesting one aim of our methods was to construct functional vegetation that would provide a range of niches for colonisation of other trophic levels. Happily in past editions I've been able to show examples where in our now mature sown and diverse vegetation we've found many species of bugs, birds and other "furry things" to be colonising sites. In just about all examples these things were not present (or seldom) present in the pre-existing exotic sward. I've got lots and lots of these images over the past five years, but thought I'd include a few that have been taken recently at GGRP sites.



Froglet at Chepstowe.



Copper Butterfly on Common Everlasting from Chepstowe.



Eggs in nest built into base of Lemon Beauty Head Clumps at Colac our site.

Brief round-up of what's been happening at GGRP sites

At the moment we are in the very happy position of having native grassland established at all our GGRP sowings. As you would be aware, each is unique in terms of species composition and levels of weeds within various treatment areas (e.g. scraped or not-scraped) depending on initial species collections, seeding rates and subsequent site conditions. However, we are now in the lovely position of having to consider the management of biomass (native and exotic) in order to maintain native species diversity (imagine if our direct seeding hadn't worked at all and there were no native species to worry about). Most readers would be aware that the 'conventional wisdom' is that high quality grassland remnants should be burnt to manage weed loads and to maintain diversity. But when is it best to burn? Can you

get a permit in time? Can a burn be undertaken safely at your site? Are the conditions right on the day? (e.g. temperature, wind speed, humidity, and moisture content of the vegetation). These are just a few of the many questions/factors that, in reality, restrict the implementation of this option. In my experience, slashing is then the most likely management option undertaken. Grazing is also a valid means to control biomass (see Zhongnan Nie and Reto Zollinger of DPI Hamilton's exciting 'Steep Hills - deferred grazing study'), where stocking rates can be sensitively managed on grass dominated native pasture.



Biomass which had been taken from the sown plots

As you will read in Geordie Scott-Walker's piece, we have had the wonderful opportunity to study experimentally both fire and slashing management at Neville Oddie's Chepstowe property. In general our GGRP sites present a unique situation for further studies in that we know exactly what is on each site, and have plant counts and biomass measurements since sowings were initiated in 2005. At Neville's we can (and have) applied these burn, slash (and leave) treatments at some scale (each plot is 10 m x 20m) across differing initial site preparation treatments (scraped and non-scraped) and across two age classes (2006 and 2007 sowings). Geordie's honours project will hopefully give some valuable insights into how we can manage the species composition trajectory of a grassland site through biomass management.

Just quickly, because I'm not sure if he'll have submitted a story for this edition of the GGRP, but my colleague John Delpratt and I took advantage of the slashing works undertaken for Geordie's project to establish a supplementary study which will investigate the impact of cut material left on the ground following slashing. We have set up treatments where various levels of biomass have been left on plots (from very little to 'clumping') and will look to see how this affects regrowth and recruitment.



plots were slashed and the biomass raked and removed at the Denis' Warncoort' site out of Colac

At our other GGRP sites, after assessment of whether biomass needs reduction, we've then used whatever option is most easily applied. For example, at Beeac and Hamilton plots were slashed (but the vegetation left), at Claire and James Dennis' property at Warncoort we slashed and raked, while at Moyston, David and Marlene burnt whatever areas that would carry a flame. It will be interesting to see how the vegetation responds at each of these sites, and hopefully use what we learn from Geordie's and Johns work at Chepstowe to further inform how we manage vegetation at all our sites.



Late season burn of Moyston site (May). Burn evident on areas of vegetation that would carry a flame

Cheers, Paul GR

What has a moth ever done for me?

The confirmation of the Golden Sun Moth (*Synemon plana*), a species listed as critically endangered under

Federal and Victorian legislations, on commercial farms near Ararat in November 2008 provides another valuable jigsaw piece in the sustainable farm management puzzle.

As insignificant as it seems to some, the finding of the Golden Sun Moth heralds potential positive changes for these farms and is testament to good management decisions in the past and adds weight to future management decisions.

The commercial farms host research sites for the 'EverGraze Low Input on Native Perennials' program which aims to utilise native grasses in harsh environments to improve profitability, sustainability and biodiversity.

The Golden Sun Moth relies on good stands of native open temperate grasslands and open grassy woodlands dominated by Wallaby Grass (*Austrodanthonia spp.*). During its two year lifecycle the Golden Sun Moth spends most of its time underground as larvae and is believed to feed on the roots of wallaby grass tussocks. The adult moth emerges around November / December flying for 2 to 4 days in which time mating and egg laying must occur as the adult moth lack a functional mouth part!



Female Golden Sun Moth

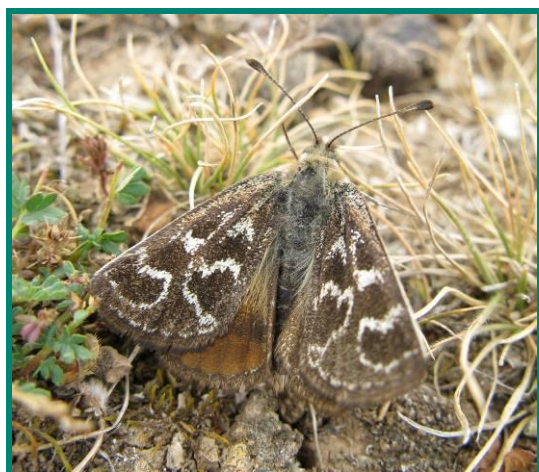
The occurrence of the Golden Sun Moth on these farms highlights the value of maintaining high levels of native perennial vegetation to sustain ecological balances. Managing low input native perennial pastures and remnant vegetation will have beneficial flow on effects such as improved water quality, invertebrate ecology, soil structure and soil food web processes, landscape values and long term economic, production and land health gains.

It is likely that in the near future, diverse, native pastures and grassy woodlands can provide additional alternative



farm income through payments for ecosystem services, carbon capture and storage as well as biodiversity conservation. Eco Tender, Bush Tender and Bush Broker are current examples.

Healthy, versatile farming systems are more resilient to change and properly managed can improve both profits and biodiversity.



Male Golden Sun Moth

For more information about the Golden Sun Moth, funding options or native grass management visit:

www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

www.dse.vic.gov.au

www.dpi.vic.gov.au

www.stipa.com.au

Reto Zollinger, DPI Hamilton

New Opportunities

As the curtain closes on the initial phases of the grassy ground cover research project, new opportunities beckon. Being a part of this project has opened my eyes to just how rare many of our beautiful native herbaceous woodland and grassland plants have become. I've also come to realize that not only are these plants rare but they also form a huge proportion of the biodiversity in woodland and grassland ecosystems. It is because of this that I have been trying to integrate some of the native herbaceous species into woodland revegetation and enhancement projects. This is not a difficult task as long as there is a supply of seed, however in the past this supply of seed seems to have been the major reason why they have not been integrated into revegetation projects. The answer to this lack of seed seems simple - we need to plan for and put in place seed production areas!!!

On that note I'll take the opportunity to talk about what has been happening in the native herb seed production area that we have been slowly building here in Maffra. We managed to collect quite a bit of seed from what is only a relatively small area (about 20m x 25m) over last spring and summer. Over the last few weeks I've cleaned bits and pieces. Below is a list of a few of the species and how much cleaned seed I have obtained so far:

Species	Total amount of cleaned seed collected from SPA	Amount of cleaned seed per foam box
<i>Chrysocephalum apiculatum</i> (common everlasting)	526g	10.52g
<i>Linum marginale</i> (native flax)	314g	7.85g
<i>Bulbine bulbosa</i> (bulbine lilly)	296g	7.40g
<i>Microceris lanceolata</i> (yam daisy)	126g	2.52g
<i>Craspedia variabilis</i> (billy buttons)	290g	9.66g

So as you can see it is possible to obtain significant amounts of native herb seed from even small seed production areas. The next step, in my opinion, is to integrate these production areas into the planning for larger scale revegetation projects in order to help bring back our rare and diverse herbaceous species.



Podalepis jaceoides in the seed production area

Andrew Wolstenholme, Greening Australia (Maffra)

Ph: 03 5145 5797



Burn, slash or do nothing: An honours project investigating biomass management at one GGRP site

Hi there and thanks for having me, my name is Geordie and I've been fortunate enough to become involved in the Grassy Groundcover Research Project through my Natural Resource Management honours year thesis on biomass management at the Chepstowe GGRP site.

Burning was a traditionally used method of managing native grasslands by indigenous Australians, and in more recent times its use has often been supplemented or replaced by slashing, grazing and unfortunately in many cases by doing nothing. These techniques are required to maintain sward vigour. In many grassland communities a build-up of biomass from the dominant grasses reduces the space between tussocks where herbs grow. When enough dead material accumulates for long enough, the grasses also become much less productive, eventually resulting in rank low-diversity grassland. The GGRP site at Chepstowe, sown annually from 2005 to 2007, now has large amounts of biomass accumulation in parts of the site; and so Paul, Neville (our host) and I decided to look at how we can manage this biomass in order to maintain species diversity and structure of the community.



I did a post-treatment survey of the effects of these treatments upon vegetation structure and I'm currently collating this data, I will have to wait until late spring to do a larger survey on biomass levels and plant species responses. It is still early but thanks must go out to Paul Gibson-Roy and John Delpratt from Melbourne University who have been supervising this work, Neville Oddie whose land and active involvement have provided the opportunity for this research and whose slasher got a good workout, and the Snake Valley CFA who generously volunteered their time and did a fantastic job of the burn! I look forward to reporting the final results of my work to you later in the year.

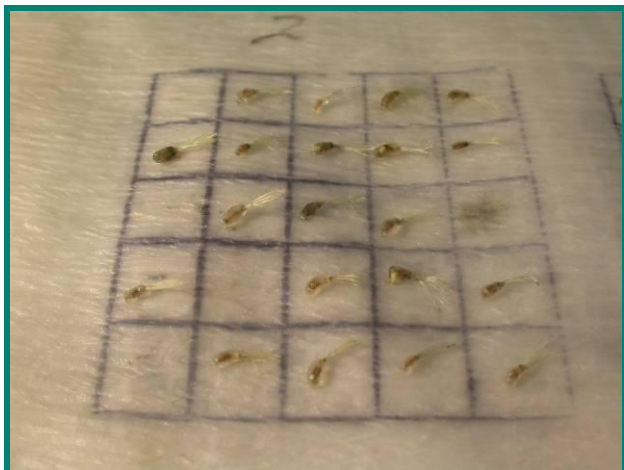
Geordie Scott-Walker



In late autumn we burnt and slashed and 'left-alone' separate parts of the vegetation, including sowings from 2006 and 2007, across both the scalped and non-scalped areas. While both these activities were successful, burning was patchy on scalped second year vegetation and slashing the dense third year vegetation sometimes required up to six passes to do the job, highlighting some practical constraints of these techniques. The introduced brown-top bent grass (*Agrostis capillaris*) has been particularly problematic as it forms dense swathes that suppress other plants, and was a major factor contributing to slashing difficulties.

Does sowing depth influence emergence success in two grassland daisies?

My name is Glenys Rose and Paul along with John Delpratt are my supervisors for the Industry Project as part of my Bachelor of Horticulture studies at Melbourne University. My project focuses on two daisies, *Leucochrysum albicans* var. *tricolor* - Hoary Sunray and *Leptorhynchos squamatus* - Scaly Buttons. Paul originally spoke to me about his observation that he'd seen relatively little field emergence of the *Leptorhynchos* at GGRP sowings, and yet there had been very good emergence of *Leucochrysum* (across a number of sites). He wondered if this might be an issue of seed volume (not enough *Leptorhynchos* and plenty of *Leucochrysum*), or perhaps it had something to do with sowing or burial depth and the seeds capacity (or lack of) to send a shoot through to the soil surface and reach sunlight.



Leucochrysum albicans seeds in a germination trial

I have started the project by conducting a germination rate test (20/10°C 12 h light, 12 h dark), for both species and will do a sowing depth trial later on in the year. Germination results have shown that *L. albicans* seed has germinated rapidly and it was good to see that almost all the seed I used was viable. *L. squamatus* is germinating more slowly and some of the seed has been attacked by fungus leaving me with tiny black furry objects amongst the bright green of new cotyledons. The sowing depth trial will be done using a pine bark base overtopped with a soil (from the GGRPs Point Henry site) to depths of 5, 15 and 25mm. The aim is to see how well seeds of these two species emerge at these different depths.



Leptorhynchos squamatus seedling in a germination trial

Because *L. albicans* is nationally endangered and *L. squamatus*, other than in a few instances, have failed to emerge in the field when sown with other grassland species any information we can gain is valuable in supporting the work of the Grassy Groundcover Research Project.

Glenys Rose

Grassy Groundcover Project @ Moolapio

G'day again from beautiful Moolapio in Geelong.

Well, preparations for the next stage of sowing (Stage 2!) are well and truly on the way. The plan this year is to sow forbs and grasses into one hectare of scraped (25m x 400m x 0.1m deep) area and purely grasses into another one hectare (25m x 400m) alongside (un-scraped).



This next stage of grassland establishment will join up with last year's sowing (4 hectares), bringing the total area sown to 6 hectares. Sadly, since we sowed last year in spring rainfall at the site has been well below average, and very little sown material has germinated. We have since taken soil samples from the sowing site and placed them into a glasshouse at Burnley. Here we've observed that a number of the sown forbs and grasses have germinated. So at least we know that there is seed still there. It just needs enough moisture it seems!

We've had a good seed collection season, both out in the field as well as in the 2 SPA's (Burnley in Melbourne and here at Moolapio). This ensures that we have enough seed to sow Stage 2 to the desired density.

The timeline for this years sowing, is as follows:

- Mid-July: process seed
- Early-August: sow grassland (getting in earlier this year to catch some moisture – hopefully)

Will let you all know how it goes in the next edition, Ace!

Rod White



The grader in action

Moolapio Seed Production Area and Nursery

A significant part of the Moolapio project is to produce seed and some seedlings for use within the 520 Hectares of Alcoa land managed by Greening Australia. The seed is used within the grasslands and shelter belts and seedlings in freshwater wetlands, shelterbelts and in locations around the property where existing populations

of species require expanding. Just this morning Rod White, Moolapio's Technical Officer has been planting *Austrostipa stipoides* within existing *Stipa* areas.

The Seed Production Area or 'SPA' as we tend to refer to the area, currently houses over 50 species of plants boxed into polystyrene foam boxes and lined along lengths of pallets laid end to end. Most of the nursery features a regulated and timed watering system that ensures the plants receive sufficient water with some seedlings requiring daily watering. Rainfall is recorded daily via a digital monitor and is factored into the watering regime. All water utilized within the nursery is recycled water transported via a local company and stored in the 22 000 litre water tank. Seed is harvested daily, dried, processed and stored on site.

As we have completed our seed collection for this time of year and as the cold weather sets in it is time to rejuvenate and prime the SPA area to reach its full working capacity by spring 2009. An audit of species is currently being conducted with decisions being made about the value of various species for seed production. Some current plants will be planted out into the various project areas to make way for a variety of new plant species. This increase in variety will maximise species diversity within the SPA and therefore within the project area. Plants being retained in the SPA will be re-boxed into fresh potting mix. The entire area will be under irrigation and plans to expand the area by another 100 boxes of plants will bring the area to a total of 400 boxes of plant species.

Vice regal grasslands

The morning was pleasantly mild, the frosts held off and the skies were clear – it was as if the Grassy Groundcover Research Project trial site knew that was correct protocol for a Vice Regal visit! Governor de Kretser delivered the keynote address for the annual Hanbury lecture at the Hamilton Base Hospital the previous evening, and together with Mrs de Kretser, toured one of the 13 original trial sites of the GGRP on Wednesday 20 May. Whilst the unkind may suggest the site was not much to look at this time of year, under instruction from our own Dr Paul Gibson-Roy even the most dormant of paddocks can come alive with signs of life representing a diversity of species. Both the Governor and Mrs de Kretsa asked a range of questions, often insightful and certainly demonstrating a knowledge of the land, farming practices and the realities of a research project at this scale.



The visit was suitably grand; the Vice regal car travels with its flag flying, the driver utters few words and the Governors Aide, Alex, managed to melt out of potential photo backgrounds as if by magic. Paul and Natalie travelled over from Melbourne and were met on site by locals and GGRP stalwarts Liz Fenton and Dave Franklin. Meanwhile, due to some swift wordsmithing by Lynne King to create a media release, we were able to gain an interview on local radio where pgr shone have a (listen to the podcast on our website www.greeningaustralia.org.au/our-solutions/biodiversity/grassy-groundcover)



From my perspective, it was a great experience and opportunity for us; it allowed us to generate some publicity for a project that has achieved significant results and we hope that by continually raising its profile, we will be ever better positioned for additional funding.

That they were lovely and personable people just happened to be a bonus.

Natalie Cook

‘Minding Your Own Biodiversity’

Report on field trip to Moyston GGRP site by delegates from the Australian Network for Plant Conservation (ANPC) Halls Gaps Conference

Recently as part of the ANPCs Halls Gap Forum held at the end of April, delegates visited the GGRP site at Moyston. This site is located on the property of Mr David Hermans and is one of five within the Wimmera CMA region. I took two bus loads of delegates across the site to look at experimental treatments showing the effects of 1, 2 & 3 years chemical weed control versus soil-removal (scrapes). While the wonderful Liz Fenton took some happy snaps (see photo) we wandered the sown paddock.



Liz Fenton captures PGR in action

I felt there was considerable interest from the delegates, many of whom were from interstate, in the general success of the field sowings. At the time of the field trip David’s paddock, which was previously a weed dominated ‘bush-block’, was covered in native grasses. Delegates were very interested in the apparent impact of soil removal (pre sowing) in retarding the competitiveness of weed species. We also observed that on these low nutrient plots, evidence of rabbit droppings (extremely prevalent in non-scraped areas), was markedly reduced. This suggested biomass on the high nutrient areas was more appealing to these herbivores.

Floristically the Moyston GGRP site is not as diverse as others. Forbs at this site seem to have been heavy predation by rabbits, wallabies and kangaroos, which again highlights the number of management factors that need to be taken into account. Despite this, delegates were excited to note numerous small wildflowers emerging across the site, which in time, may consolidate from vegetative structures if grazing pressure reduces.



All-in-all it was a very interesting stop-over at the Moyston site where local and interstate delegates from the ANPC forum got to see our GGRP works for themselves, and were able to make up their own mind on its relative merits.



Delegates at ANPC forum making their way across the established wallaby grass sward at the GGRP Moyston site

Dr Paul Gibson-Roy

Keeping the diversity in reconstructed grasslands

One of the exciting findings of the GGRP has been the wide variety of species that can be sown together to establish rich and colourful grasslands. The challenge now is to keep those species growing and regenerating into the future in functioning communities. Paradoxically, the perennial tussock grasses that are critical to the structure of these communities can be too successful. If they become too dense, they fill or overshadow the gaps occupied by forbs that add much of the diversity and seasonal colour to these fantastic communities. Traditionally, fire would have been an important agent for reducing the grass foliage and opening up the gaps between tussocks, allowing the forbs to thrive.

Because burning is not always practical, Paul and I want to know whether mowing is an effective way to control the grasses, maintain the gaps and retain the forbs in a reconstructed grassland. An important part of this question is whether the cut grass can be left on the site or whether it should be removed to avoid damaging the cut vegetation.

The GGRP site on Neville Oddie's property at Chepstowe (just west of Ballarat) provides a great opportunity to study the impact of mowing on communities of two ages

(sown spring 2006 and spring 2007) and two soil preparations (herbicide/cultivate and scrape).

Our research is using sections of the plots that have been mown for Geordie Scott-Walker's study (see his article in this edition). To simulate a range of cut-and-remove and cut-and-leave options for each of the four reconstructed communities, we have placed known quantities of cut grass on randomly allocated plots in each of the 20 'cut' replications prepared for Geordie's experiment.

Our five cut grass treatments are based on biomass data Paul has collected from these plots over several years. They represent various densities from heavy clumping of cut grass to 'cut and remove'. The applications of cut grass per square meter are 2 kg; 1 kg; 500 g; 250 g and 0 g (representing cut and remove).



Cut grass applied at 1 kg per square metre to a scrape plot sown in spring 2007.

Over the next growing season, we'll measure the effect of the cut grass on the structure of the communities by recording mulch cover, grass clump number and cover, forb number and cover, and percentage of bare earth. It will be interesting to learn how the various densities of cut grass impact on the structure of the vegetation and to gain some sense as to whether mowing can be used to favour the survival of a diverse range of forbs amongst vigorous perennial grasses. Subsequent experiments may look at factors such as the height and frequency of mowing.



L to R. Glenys Rose and Debra Mckeown on site at Chepstowe.

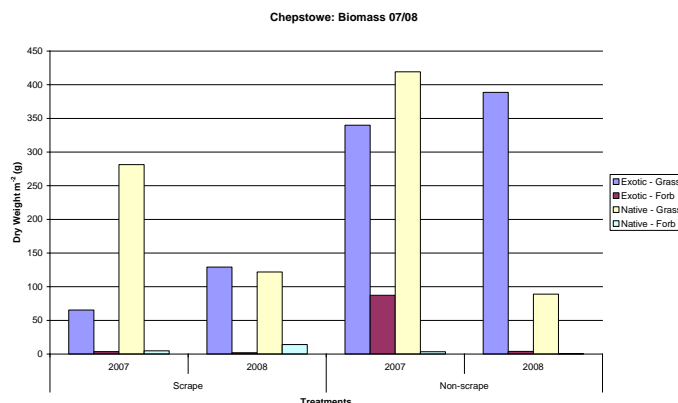
Paul and I take this opportunity to again thank Neville for his support and direct involvement with this work, and Debra and Glenys (see their articles, this edition) for their help in setting up the experiment.

John Delpratt (ceciljd@unimelb.edu.au)

Some interesting data from Chepstowe ...

As most readers would realise the GGRP sites were established as experiments imposing various treatments. This was done so we could quantify the various developments at each site and perhaps learn from these findings. I've reported some general findings previously (e.g. the Werribee Zoo site). Below is some interesting data comparing two years of biomass measurements from vegetation sown in 2006 at Neville Oddie's Chepstowe site. There are numerous factors likely to be influencing these outcomes including nutrient conditions, rainfall, weed identity and treatment type. For example, it was clear that between the scraped and non-scraped areas sown in 06 that weed loads following twelve months growth (blue and crimson columns) were higher in the nutrient rich non-scraped plots. However, it was also clear that the native grasses (yellow column) grew more vigorously under these conditions (indeed dominating in that first year following sowing). Then look forward two years after sowing and its interesting that:

1. exotic grass and native forb biomass increased in scraped plots while native grass biomass declined, and
2. exotic grass biomass increased further in the non-scraped plots while the native grasses declined pretty dramatically and the native forbs almost disappeared.



It's interesting to note that the main exotic grass species we are dealing with at this site is brown-top bent grass, a particularly problematic character that now covers hundreds and hundreds of kilometres of roadsides in Victoria. It is rhizomatous and forms very thick sward that collapse in winter to smother the ground and for these reasons I think its one of the biggest threats to grassland remnants (particularly where ploughing of roadside fire-breaks spreads the vegetative material and loosens the soil up for this species to grow into and dominate) . While the grasses and forbs are still doing ok in the scraped plots and grasses to a lesser degree in the non-scrape, this graph indicates why managers of grasslands need to implement biomass management techniques in order to preserve native biodiversity. Building on information of this type, we will use future studies such as those discussed earlier, to help us to determine what are the most appropriate methods and conditions to manage factors such as excessive biomass accumulation.

Dr Paul Gibson-Roy

What's been happening at the Burnley SPA.

Since completing a research project with Paul Gibson-Roy last year, I have become even more enthusiastically supportive of the GGRP and its approach to large-scale grassland restoration.

I am now volunteering one day a week, helping out with various jobs at the Burnley SPA (which is set up to help produce seed for the Point Henry 'Moolapio' project near Geelong), continuing to learn more as I go. Over the past couple of months, Rod White from Greening Australia, Paul and myself have been beavering away in order to prepare seed for spring sowings.



We have been seed sorting, germinating and planting seedlings for new boxes and cleaning up many of last year's seed production boxes. Rod and Paul have sorted through all the stored seed at Burnley SPA. They have developed such a neat, tidy and organised system that I think one of them must secretly be a librarian.

We have also been germinating a wide range of stored seed collected in the field and from the Burnley SPA. The photo below shows trays of *Microseris lanceolata*, *Caesia callantha*, *Rutidosia leptorrhynchoides*, *Calocephalus sonderi*, *Podolepis jaceoides*, *Convolvulus erubescens*, *Chrysocephalum apiculatum* and *Asperula conferta*.



We currently make weekly visits to the hot-house to see how they are all going and have been most successful with *Rutidosia*, *Chrysocephalum* and *Calocephalus*; all which readily germinate in a matter of weeks. We have had less success with *Microseris* and *Caesia* and are currently testing samples of these seeds for viability. The *Microseris* seeds are starting to come up and it may be that they just need nearer 8 weeks to get going.

We have planted over 150 boxes of seedlings (*Leucochrysum albicans*, *Helichrysum scorpioides*, *Leptorhynchus squamatus*, *Podolepis jaceoides*, *Rutidosia leptorrhynchoides* and *Stylidium graminifolium*). We have also put over 300 *Rutidosia* seedlings into forestry tubes to try some direct planting at the various sites.

Over recent weeks we have started tidying, pruning and re-boxing the contents of last year's seed production boxes. So far we have done the *Pelargonium australe*, *Ptilotis spathulatus*, and *Microseris lanceolata* boxes. Hopefully they will recover from the shock of it all over the next few months and produce lots of seed for another year.



Rod White on site

Paul is starting to make the contented sounds of a coordinator that can see that the tasks gradually getting done and it has been enjoyable for us all to do it together.

Lisa Rasmussen

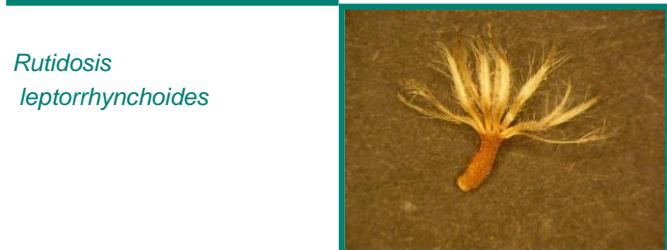
The effect of harvest season on seed viability, after-ripening period and germinability of grassland Asteraceae

I am a third year student, enrolled in Bachelor of Horticulture at University of Melbourne whose interest is in Australian plants and ecosystems. As part of the degree I am required to do an Industry Project, which is a research project selected from a number of projects offered by University staff and industry partners. As part of the subject Revegetation and Landscape Restoration, undertaken the previous semester, an interesting lecture was presented by Paul on the Grassy Groundcover Restoration Project including a visit to the Werribee site. I was therefore very interested in working on this project with Paul for the Grassy Groundcover Restoration Project.

The purpose of my research project is to investigate if there are any differences in early harvested spring and late harvested autumn seed of three grassland Asteraceae species, *Rutidosia leptorrhynchoides*, *Microseris lanceolata* and *Vittadinia gracilis*.



Microseris lanceolata



Rutidosia leptorrhynchoides



Vittadinia gracilis

The seed collected from these three species has been grown in a seed production system based at Burnley College for the Point Henry 'Moolapio' restoration project and plants growing under these conditions produced seed over an extended period (spring, summer and autumn). We tested seed lots taken from spring and autumn harvests.

This project will assess the quality of the seed produced from each seed lot by quantifying the percentage of viable seed produced; the percentage of seed that germinated; and if cold stratification can improve germination rates. Seed germination trials are to be conducted under cabinet conditions at 20°C light and 10°C dark for 28 days. Two germination trials will be conducted, one in semester 1 and another in semester 2.

The semester 1 trial has just concluded but is yet to be assessed. My initial results show that a high percentage of *Rutidosia leptorrhynchoides* germinated rapidly and that only a small percentage of *Microseris lanceolata* germinated within the 28 day period. I also found that the spring harvested seed of *Vittadinia gracilis* appear to have germinated at a higher percentage than the autumn harvest, but the reason for this, at this stage, remains unclear.

Methods for the study

In the semester 1 trial the seed of the spring harvested seed has had a period of dry storage for approximately 5 months, and the autumn harvested seed approximately 1 month.

In the semester 2 trial the seed of spring harvested seed will have had a period of dry storage of approximately 9 months and the autumn harvested seed approximately 5 months (Table 1). I will undertake statistical analysis of seed viability and germination rates of the spring and autumn harvested seed that has been stored for 5 months to determine if storage duration is more significant than harvest time. In the semester 2 trial, an additional treatment of cold stratification at 4°C will be applied, and the results analysed to determine if treatment improves germination rates.

Semester 1 Germination Trial	Semester 2 Germination Trial
Spring harvested seed @ 5 months	Spring harvested seed @ 9 months
Autumn harvested seed @ 1 months	Autumn harvested seed @ 5 months
Results - harvest time? storage duration?	Results - Spring @ 5 months - Autumn @ 5 months If results are similar then the duration of storage is more significant than the time of harvest.

Table 1: Overview of experiment

I hope that the information provided my study helps to inform 'restorationists' who use fresh seed in propagation or field sowings; and to those who produce seed in SPA over longer harvest periods than what is commonly found in the field with 'wild' populations. If quality seed can be produced over longer periods from plants grown in SPAs it follows that seed supplies for restoration activities can be greatly increased. This will in turn reduced the requirement and possible negative impacts to wild populations of repeated field harvest.

Debra McKeown

Editors note:

The GGRP section of our website has been referred to a number of times in this edition, we are gradually building on it, so we hope you find this useful. Next edition I suspect we will distribute the newsletter via a link to the site rather than as an attachment – I'll take feedback on this. Cheers

Natalie Cook



Stop press: Victorian Grassland Restoration voted World Class

To all those who have been associated with the GGRP. I can't believe this slipped my mind. I was wandering around on the weekend thinking we'd just about got everything signed and sealed for this edition of the GG when I remembered the following media release. (www.greeningaustralia.org.au/community/vic)

Some may already be aware we were recognized with this award (instigated by Ecological Management & Restoration and the Society for Ecological Restoration International), but I was up at Bendigo popping in to have a cup of coffee with Paul and Jo at our/their Ravenswood site and I realised they had not heard this news. So I can't assume that other GGRP people are not also in this boat.

From my point of view it is really lovely to be recognized for the work we have done and what has been achieved over these past years. However, with or without the award I really do congratulate and thank every one of you for the incredible effort and energy you've contributed to ensuring that we now have a number of sites where species rich grassland is now established and thriving. Further to this, I think that our knowledge of Seed Production Systems, which will allow us to grow the quantities of seed to undertake these restoration works, has been greatly advanced.

There are a great many things in this world that I do not know, but one that I very much do is; this project would not have succeeded without the incredible input of each and every one of you wonderful mob of people.

Paul GR

Want to know more about the GGRP?

Contact:

Paul Gibson-Roy
Research Project Leader
9250 6885
roypg@unimelb.edu.au

Would you like to subscribe to the Grassy Groundcover Gazette?

Please email:

Lynne King
king@gavic.org.au

or for more information about Greening Australia:

www.greeningaustralia.org.au

