

# Australian Grasses Study Group



Association of Societies for Growing Australian Plants

Autumn 1989

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## Editorial

Does anyone have any ideas for a name and/or logo for our newsletter? Some name suggestions have been Whispering Grass, Grassed (as in last Frontier, Growing Australian Grasses and Australian Grasses Talk.

The newsletter is now taking advertising and both members and non-members can advertise though members will get a discount. Rates are available from the editor (see page 18).

The feature plant in this issue is *Microlaena stipoides* with which I've had no success from seed. However, it seems this was because my seed mix was too sandy (3 parts sand: one part peat moss) and not heavy enough as *Microleana* seeds must be kept moist (though not too wet). Russell Starr (pers. comm.) suggests covering the seed tray with glass to reduce evaporation and Dr. Whalley (see Correspondence) suggests germinating the seeds on moist blotting paper/cotton wool, inside a petri dish, and then pricking them out:

However, I've been able to acquire some divisions of *Microlaena* from Enid Robertson, and they've all taken quite nicely (put them in February 27). By the 8th day shoots had appeared on half of them, and within 3 weeks even the smallest divisions, and those I'd given up on, had sprouted. However this was not without daily watering, and I've also got them in a shaded spot.

I've also been burning off the *Stipa* (*S. nodosa*)

this year, a patch on the 11th of February (roughly a metre<sup>2</sup>) and a larger one on the 22nd of March (2-3 m<sup>2</sup>). After a good soak with the sprinkler, I had a nice carpet of seedlings up within 6 days. However, the results indicate the first burn was too early - seed germination was patchy and none of the burnt tussocks resprouted, though some did begin to but died back. In contrast, the second burn has produced an even cover of seedlings and most of the tussocks have resprouted strongly.

As an idle observation, I noticed far more insect activity and variety amongst the *Stipas* than the *Themedas* (2 m<sup>2</sup>), over the spring and summer, and will look more closely at this next spring.

In Correspondence, Helen Bizzai observes that *Neurachne alopecuroidea* and *Enneapogon nigricans* do not like being pricked out into tubes and this has also been my experience with *Neurachne*, and with *Dichanthium*, transplanted

from seed trays. Helen suggests planting directly into tubes (I would suggest at least "coke can" size) and, as a general rule, to prick out plants in the cooler months.

At this point I would like to invite contributions to the next issue, on the current technology for harvesting, cleaning and direct-sowing native grass seed/florets. Deadline for copy will be the end of the third week in June.

Dermott Kelly

### Erratum

Newsletter no.4, Correspondence: Barbara Buchanan's new address is RMB 1590, Myrree, Vic. 3732.

Page 5, Sowing florets, step 9: *spikelets* should read *florets*.

## *Rusts and Smuts of Chloris, Danthonia, Dichanthium, Stipa and Themeda in Australia*

John Walker

The following list has been compiled from specimens and records filed in the Plant Pathology Branch Herbarium (Herb. DAR) at Rydalmere. It gives the rusts and smuts, with the grass species on which they have been recorded or reported, and the States where they occur. It must not be assumed that because either a particular host species or State has not been listed

for a particular pathogen that the pathogen does not occur on that host or in that State. Collection of pathogens on these grasses have not been made systematically and not all sources of information have been checked. Thus both the host ranges and geographic distribution of the pathogens could be wider than listed here.

### *Chloris*

#### 1. Rusts

Puccinia chloridis Speg.

Leaf rust

on *Chloris acicularis*

Q.

#### 2. Smuts

Sphacelotheca valentula (H. Sydow) J. Walker Inflorescence smut

on *Chloris acicularis*

NSW

Ustilago induta H. Sydow

Floret ovary smut

on *Chloris lobata*

NT

*C. truncata*

NSW

*C. sp.*

Q.

## *Danthonia*

### 1. Rusts

Uromyces danthoniae McAlp.

Leaf rust

on <i>Danthonia caespitosa</i>	SA, WA
<i>D. linkii</i>	NSW
<i>D. penicillata</i>	NSW, Vic, SA
<i>D. semiannularis</i>	Vic, Tas
<i>D. setacea</i>	SA
<i>D. sp.</i>	Q.

### 2. Smuts

Ustilago agropyri McAlp. (formally Ustilago readeri H. Sydow & Sydow)

Leaf, stem and inflorescence smut

on <i>Danthonia auriculata</i>	NSW
<i>D. eriantha</i>	NSW
<i>D. penicillata</i>	NSW, Vic, SA, WA, Tas
<i>D. pilosa</i>	NSW, Vic, SA
<i>D. semiannularis</i>	NSW
<i>D. sp.</i>	NSW

Ustilago comburens Ludwig

Inflorescence and shoot smut

on <i>Danthonia caespitosa</i>	NSW, Vic SA, Tas.
<i>D. penicillata</i>	NSW, SA
<i>D. pilosa</i>	NSW, WA Tas.
<i>D. racemosa</i>	Tas.
<i>D. setacea</i>	NSW, SA
<i>D. sp.</i>	NSW, Vic, SA

## *Dichanthium*

### 1. Rusts

Puccinia duthiae Ell. & Tracy

Leaf rust

on <i>Dichanthium sericeum</i>	Q.
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### 2. Smuts

Sphacelotheca sahayai Mundkur

Floret ovary smut

on <i>Dichanthium affine</i>	Q.
<i>D. sericeum</i>	NSW
<i>D. tenue</i>	Q.
<i>D. sp.</i>	NSW

## *Stipa*

### 1. Rusts

<u>Puccinia flavescens</u> McAlp.	Leaf rust	
	on <i>Stipa arachnopus</i>	WA
	<i>S. drummondii</i>	SA
	<i>S. elegantissima</i>	WA
	<i>S. eremophila</i>	SA
	<i>S. flavescens</i>	SA
	<i>S. hemipogon</i>	WA
	<i>S. macalpinei</i>	WA
	<i>S. pubescens</i>	SA, Tas.
	<i>S. scabra</i>	NSW, SA
	<i>S. semibarbata</i>	Vic, SA
	<i>S. variabilis</i>	SA, WA

In the available Western Australian lists, the rust in that State is listed as 'Puccinia ?flavescens McAlp.' and examination of specimens would be needed to confirm these reports.

### 2. Smuts

<u>Tilletia texana</u> Long apud Clinton	Floret ovary smut	
	on <i>Stipa setacea</i>	Q.

Tolyposporium restifaciens D. Shaw - Ropy smut, causing shredding of leaves and young shoots into long, rope-like, twisted strands.

on <i>Stipa aristiglumis</i>	Q., NSW
<i>S. bigeniculata</i>	NSW
<i>S. blackii</i>	NSW
<i>S. setacea</i>	NSW
<i>S. stiposa</i>	Tas.
<i>S. sp.</i>	SA

<u>Urocystis stipae</u> McAlp.	Leaf and stem smut	
	on <i>Stipa aristiglumis</i>	Q.
	<i>S. scabra</i>	SA
	<i>S. variabilis</i>	Vic.

Ustilago hypodytes (Schlecht.) Fr. Stem smut. As listed here, the species concept includes the smut called Ustilago spgazzinii Hirschh. by some authors, which is regarded here as not distinct from U. hypodytes.

on <i>Stipa aristiglumis</i>	Q., NSW
<i>S. bigeniculata</i>	NSW
<i>S. densiflora</i>	NSW
<i>S. eremophila</i>	SA
<i>S. falcata</i>	NSW
<i>S. flavescens</i>	SA
<i>S. scabra</i>	NSW

<i>S. setacea</i>	Vic., SA
<i>S. variabilis</i>	NSW, WA
<i>S. verticillata</i>	Q.

### *Themeda*

#### 1. Rusts

<u><i>Puccinia versicolor</i></u> Dietel & Holway	Leaf rust on <i>Themeda australis</i>	Q., NSW, SA, WA
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#### 2. Smuts

Several smuts have been described from *Themeda*, both in Australia and overseas. The exact identity, generic placement and specific differences of the species described from Australia requires further study and the arrangement listed below must be regarded as an interim classification until detailed work is carried out.

*Sorosporium anthistiriae* (Cobb) Ling    Inflorescence smut

This includes the smut formally called *Tolyposporium bursum* (Berk.) McAlp. by McAlpine but this species, originally described by Berkeley from India, is considered distinct from the Australian smut.

on <i>Themeda arguens</i>	Q.
<i>T. australis</i>	Q., NSW, Vic, SA

*Sorosporium enteromorphum* (McAlp.) McAlp.    Floret smut

on <i>Themeda australis</i>	Q., Vic
<i>T. avenacea</i>	SA

*Sorosporium* sp.

on <i>Themeda arguens</i>	NT
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*Sphacelotheca anthistiriae* (Petch) Ling    Inflorescence smut

This includes the smuts formerly referred to by some authors as *Sphacelotheca exserta* (McAlp.) Ciferri and *S. vryburgii* Zundel.

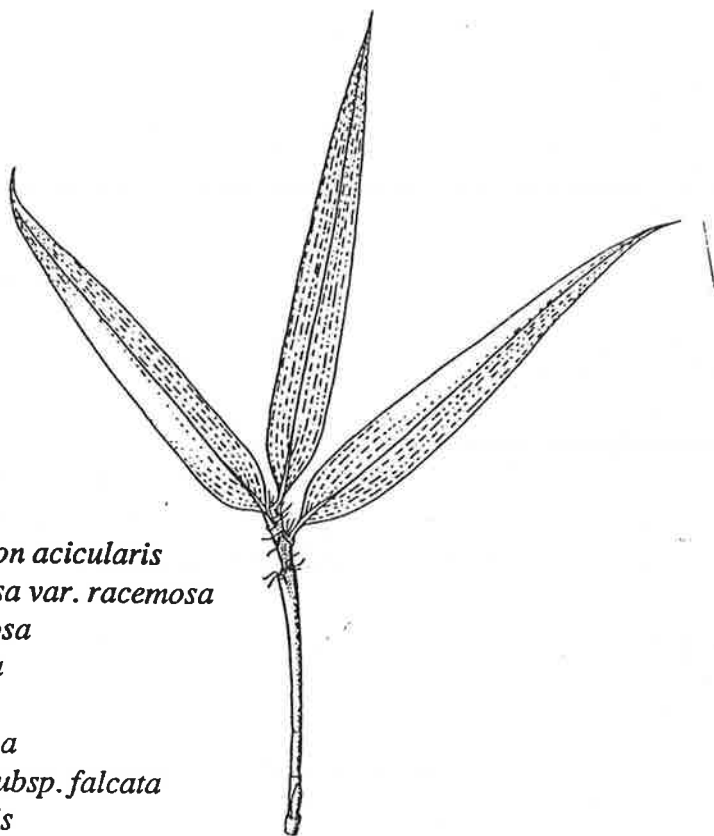
on <i>Themeda australis</i>	Q., NSW, Vic, Tas
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All the diseases listed above appear to be native pathogens on native hosts. The rusts appear to cause relatively little damage to their hosts in nature but if the hosts were brought into cultivation, it is possible that heavier rust infection may be observed on occasions. The smuts listed as inflorescence smuts often destroy all the inflorescences produced by a plant and some are probably systemic in the plant. In grasses that have a perennial rootstock, this would mean that each year the inflorescences

would be smutted and, if being cultivated for the inflorescences, such clumps would need to be replaced. I may say that, in most cases, the detailed life cycles of these smuts have not been studied. For example, it is not known for most of them how or when infection occurs, whether it is in the seedling stage, through young vegetative shoots or at the flowering stage. Generally speaking, care should be taken to propagate plants for cultivation only from healthy mother plants.

The host names given in the above list are those used in the various literature sources and on the specimens from which the lists were compiled. Some of the hosts may now be known under different names.

**John Walker**  
Principal Research Scientist  
Biological and Chemical Research Inst.  
PMB No.10, Rydalmere. NSW 2116



According to the *Flora of South Australia* (1986):

<i>Chloris acicularis</i>	is now called	<i>Enteropogon acicularis</i>
<i>Danthonia penicillata</i>	"	<i>D. racemosa</i> var. <i>racemosa</i>
<i>D. semiannularis</i>	"	<i>D. caespitosa</i>
<i>Stipa arachnopus</i>	"	<i>S. puberula</i>
<i>S. aristiglumis</i>	"	<i>S. gibbosa</i>
<i>S. bigeniculata</i>	"	<i>S. curticoma</i>
<i>S. falcata</i>	"	<i>S. scabra</i> subsp. <i>falcata</i>
<i>S. pubescens</i>	"	<i>S. pubinodis</i>
<i>Themeda australis</i>	"	<i>T. triandra</i>

Editor

## Bushland Flora

### Introducing Bushland Flora's Services

We would like to introduce ourselves, and outline how we may be able to help you in the re-establishment of indigenous vegetation. Our services include:

\* **Contract Revegetation of Native Grasses** (please find project summary sheets below). This is our speciality. We supply seed and also have herbicide information and can be contracted to undertake complete native grassland revegetation projects. We currently have seed in stock of the following:

Kangaroo Grass (*Themeda triandra*). Probably the most ornamental and most-demanded native grass. We have selective herbicides for its easy establishment. We recommend good weed

control be conducted prior to sowing in Spring (October).

Seed Cost (per square metre):

100 minimum = \$2.00  
500 - 1000 = \$1.50  
over 1000 = \$1.00

Bristly Wallaby Grass (*Danthonia setacea*). Best suited for clay embankments. Incomplete herbicide weed control available. We recommend sowing only on weed-free sites. Sowing (without irrigation) in Autumn-Winter (April-July), or any time under irrigation.

Seed Cost (per square metre):

100 min. = \$1.00  
 500 - 1000 = \$0.75  
 over 1000 = \$0.50

Large Tussock Grass (*Poa labillardieri*). Large tussocks for unmown, moist situations (ideal for creekside areas). Slow growing when small, so good weed control essential. Sow in Autumn-Winter.

Seed Cost (per square metre):

100 min. = \$2.00  
 500 - 1000 = \$1.50  
 over 1000 = \$1.00

\* **Contract Direct-seeding of indigenous trees and shrubs** (Shire of Eltham - Peck's Dam, summary sheet below). We have quantities of seed in stock of a variety of trees and shrubs indigenous to the Melbourne area, and can be

contracted to do "Bushland Flora Nuclei Seeding".

\* **Contract Planting of indigenous trees, shrubs, herbs and grasses.** We have access to tubestock of indigenous plants, and can be contracted to undertake planting programs.

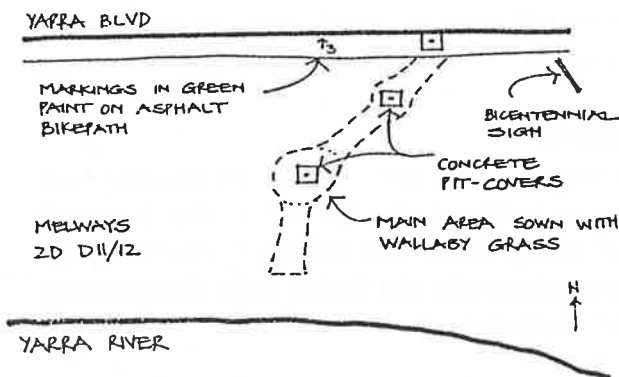
We enclose our brochure and project summary sheets, and invite your inspection of these projects at your own convenience. We also have several project summary photo albums and would be pleased to lend these to you. Please contact us should you require any further information.

Andrew Paget and Ian Shimmen  
 Bushland Flora, 14 Seascope Close,  
 Ferntree Gully. Victoria. 3156  
 Phone: (03) 758 5416

## Job Summary Sheets

### Wallaby Grass on R.C.A. Pipetrack

#### Location:



#### Client's Requirements:

The Road Construction Authority required revegetation of a pipetrack which took water from the Boulevard down to the Yarra. Native grasses were desired because of their capacity to blend in with the bushland vegetation of the area adjacent to the pipetrack.

#### Site Preparation:

After the completion of work the area was covered in clay subsoil, ideal for Wallaby Grass because of its low nutrients and freedom from

weed seeds. For this reason no site preparation was required - there were no weeds requiring spraying and the soil was cultivated through construction work. No residual herbicides were used.

#### Species Selection:

The Wallaby Grass used was *Danthonia setacea* which naturally inhabits dry exposed clay subsoils. This species grows all year round, but requires cooler temperatures and good moisture levels for best germination.

#### Sowing:

The site was hand surface sown in Spring 1987, and the area mulched with Wallaby Grass straw. Pure seed was sown at the rate of 3000 seeds per square metre. A light cover of Wallaby Grass straw was applied as mulch, and because of the steep slope, a bitumen emulsion spray was used to keep the straw in place.

### Growth:

The grass germinated well in the Spring rains, but because of its slow growth and the harsh Summer which followed, most of it browned off badly over the first Summer. However, the Autumn of 1988 saw it regrow and establish well before the 1988/89 Summer.

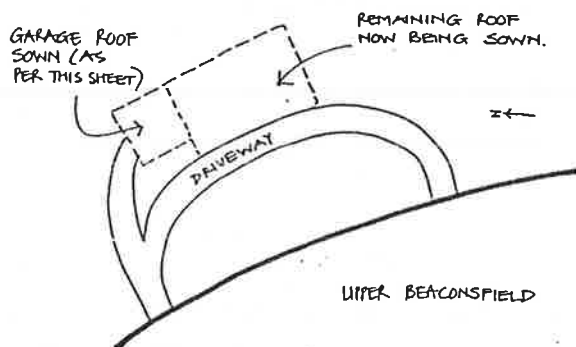
### Comments:

We now recommend that (without irrigation)

## Kangaroo Grass on Underground House Roof

### Location:

Please note that this is private property and arrangements must be made with the owners for site inspections (Phone the Levens on 059.44.3828).



### Client's Requirements:

The owners of this underground house wanted to blend their house into the surrounding 10 Acres of bushland, create a thick insulating cover on the roof, and have a lush green cover over Summer to aid in fire-prevention.

### Site Preparation:

This site was prepared by the owners over 6 months from seed harvesting in Summer to seed sowing in the following Spring. Repeated sprays of "Roundup" (Glyphosphate) were used to kill existing weeds. No residual herbicides were used in this case.

### Species Selection:

Kangaroo Grass (*Themeda triandra*) was used because it is already a dominant species on site, and seed used in this work was collected from

sowing of Wallaby grasses (*Danthonia spp.*) be done in Autumn and Winter to give them enough time to establish before the first Summer. This is also the time when the cooler temperatures and high moisture levels ensure the best germination.

Photo of Ian Shimmen, of Bushland Flora, inspecting (in August 1988) the pipetrack sown down with Wallaby Grass.

plants growing on site, so as to help blend the house into the surrounding bush. It also forms tussocks to 300 mm tall, so provides a thick layer for insulation, and it is summer growing so green during the fire season.

### Sowing:

The site was hand surface sown in Spring 1987, with hand-cut stalks and heads from the previous Summer. The soil was not prepared to a seedbed standard, and the soil surface was rather hard at sowing. The straw blew away in the first week or so, leaving the seeds which drilled into the soil. The exact quantity of seeds sown is impossible to determine.

### Growth:

No watering was done except for one very hot spell in February. By the end of March almost total foliage cover was achieved, with the grass germinating with the Spring rains and growing over the Summer.

### Comments:

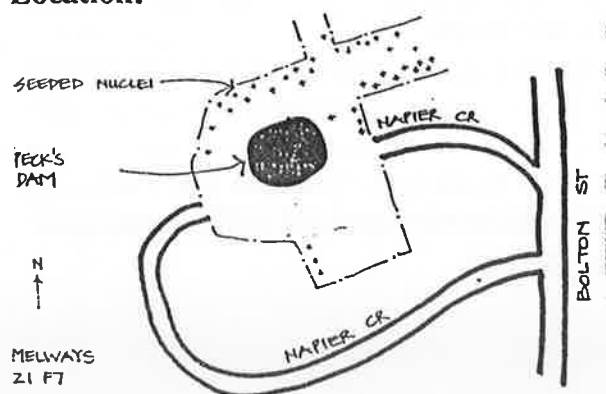
We always recommend that Kangaroo grass is sown in Spring to give it a full growing season to establish before it becomes dormant for Winter. If irrigation is available then a late sowing may also be possible, but Kangaroo grass is very susceptible to moisture stress during gemination.

Photo of Ian Shimmen, of Bushland Flora, on the roof of the Levens' underground house in August 1988.



## Bushland Nuclei Seeding at Peck's Dam for Shire of Eltham

### Location:



### Client's Requirements:

The Shire of Eltham is working with the community surrounding Peck's Dam to develop the area as a natural parkland, and desired the reinstatement of the indigenous shrub layer which had been removed through grazing and clearing.

### Site Preparation:

200 1m x 1m patches throughout the reserve were sprayed with a knockdown and residual herbicide 6 weeks prior to seeding (Sept. 1988).

### Species Selection:

The following species indigenous to Eltham were included in the seedmix: Golden Wattle (*Acacia pycnantha*), Black Wattle (*A. mearnsii*),

Blackwood (*A. melanoxylon*), Lightwood (*A. implexa*), Hedge Wattle, Prickly Moses (*A. verticillata*), Bidgee-Widgee (*Acaena anserinifolia*), Common Cassinia (*Cassinia aculeata*), Shiny Cassinia (*C. longifolia*), Black She-oak (*Casuarina littoralis*), Bristly Wallaby Grass (*Danthonia setacea*), Golden tip (*Goodia lotifolia*), Yellow Hakea (*Hakea nodosa*), Furze Hakea (*H. ulicina*), Tree Everlasting (*Helichrysum dendroideum*), Burgan (*Kunzea ericoides*), Victorian Xmas Bush (*Prostanthera lasianthos*), Golden Bush Pea (*Pultanaea gunnii*), and Grass-leaf Trigger-plant (*Stylidium graminifolium*). Quantities of seed of each species were determined to result in equal portions of each of the species, and were designed to result in an average of about 15 plants per patch.

### Sowing:

Six weeks after spraying, the patches were niche-sown by creating a herbicide free niche in the centre of each herbicide patch. This seeding was done in late October 1988.

### Growth:

With the late rains and weed-free patches both germination and growth was good. By February 1989 the seedling tally was as follows:

<i>Acacia implexa</i>		<i>Danthonia setacea</i>	35 = 0.7%
<i>Acacia mearnsii</i>		<i>Goodia lotifolia</i>	33 = 0.66%
<i>Acacia melanoxylon</i>	266 = 5.28%	<i>Hakea nodosa</i>	3 = 0.06%
<i>Acacia paradoxa</i>		<i>Hakea ulicina</i>	1 = 0.02%
<i>Acacia pycnantha</i>		<i>Helichrysum dendroideum</i>	0
<i>Acacia verticillata</i>		<i>Kunzea ericoides</i>	0
<i>Acaena anserinifolia</i>	0	<i>Prostanthera lasianthos</i>	0
<i>Cassinia aculeata</i>		<i>Pultanaea gunnii</i>	14 = 0.28%
<i>Cassina longifolia</i>	3 = 0.06%	<i>Stylidium graminifolium</i>	0
<i>Casuarina littoralis</i>	8 = 0.16%		

Patches with no plants 14%      Average survival rate 0.4%

As we were aiming for a survival rate of 0.5% per species, and obtained 0.4% we are pleased with the result. Of the 18 species 22% failed to appear,

and the Wattles were the most successful with an average survival rate of 0.88%, although seedlings of other species may germinate with

Autumn rains.

**Comments:**

We left staking of the patches to the Shire, and by the time it was done many of the patches had been accidentally mown by neighbours or were unable to be located, so we would advise immediate staking be part of any future niche-seeding work. We also suggest that selective herbicides be used to allow the sowing of native grasses in the herbicide zone around each niche. This will serve the dual purpose of being a barrier

to re-invasion of weeds, and forming a basis from which the native grasses could spread under the canopy of the developing clump of trees and shrubs.

We believe that for more economical use of seed resources the mix be designed to result in about 2-3 plants per patch, so that the seed mix used for this work could have been split into 5 different patches and used to establish 1000 patches rather than just 200.

*"Cutting back on a weekend chore"* (From *The Advertiser*, January 5th, 1989)

**Canberra:** The weekend Australian ritual of mowing the lawn could be a thing of the past if CSIRO researchers succeed in adapting native Australian grasses for use as decorative lawns. The native grasses are hardier, use less water and require less mowing than European-originated lawns - but they also have some problems which need tackling.

Canberra Division of Plant Industry researcher Dr Iain Dawson said the CSIRO was about to seek a seed company to take over its work on one grass variety - *Danthonia* or wallaby grass - for use on road verges and public grasses areas. Dr Dawson said it was difficult to collect commercial quantities of seed from native grasses because of the way their seed heads shattered.

The native varieties were coarser than the European lawns and could not be used for sporting grounds as could exotic grasses. However, *Danthonia* required mowing only twice a year and used much less water than the exotic grasses. He said the research had not yet reached the stage where Australians might opt for native rather than exotic grasses when planting front lawns.

Householders might have to rethink their ideas about what makes lawns beautiful before that happened, he said. "You've got to change

people's perception of what nice landscape should look like," Dr Dawson said. "Australians tend to have a very European view. It (native grass) will be more authentic Australian landscape." For example, the CSIRO was looking at interspersing native grass lawns with native flowers to give a decorative effect.

Dr Dawson said the CSIRO's plans to market a dwarf version of the native Geraldton Wax flowering shrub (*Chamelaucium uncinatum*) also were close to commercialisation, with a consortium now preparing to take over the project. The first potted Geraldton Wax plants should be available in Australia about mid-way through this year and would be sold as an alternative to fresh flowers.

Geraldton wax shrubs usually grew to a height of about four metres, but the CSIRO technique would use chemicals to cause the shrubs to flower while only 15 centimetres high. The resulting potted flowers would keep for a month or more and then could be planted out in the garden or thrown away, Dr Dawson said. The plants would be sold in the same way chrysanthemums and other cut flowers were marketed.



## Display Gardens

### Tasmania:

The Grasslands Gully/Domain Native Flora Garden, on Upper Domain Road, Hobart

### Victoria:

Bushland Flora nursery "indigenous display garden", Ferntree Gully.

The Botany System Garden at Monash University, includes native grasses. A System Garden is a collection of growing plants chosen and arranged for a particular educational purpose - the teaching of plant taxonomy. Care has been taken that there is easy access to any plant.

Royal Botanic Gardens, South Yarra, is in the process of establishing display beds of "interesting" native grasses. Contact Josie Dujmovic, c/- Dr. R. Spencer (Horticultural Botanist), Royal Botanic Gardens, Birdwood Avenue, South Yarra. 3141.

### South Australia:

Black Hill Flora Centre, Athelstone - grass display beds.

*Dichanthium sericeum* in flower when observed on the 16th April (1989) and the following were still flowering:

*Astrebla pectinata*

*Chloris* sp.

*Enneapogon nigricans*

*Eragrostis infecunda*

*Themeda triandra*

### New South Wales:

Native grasses lawn - University of New England, Armidale. (*Australian Plants* June, 1983).



## Grass Identification

### "Plants of Western New South Wales"

Cunningham, G.M. et al (Soil Conservation Service of NSW & NSW Govt. Printing Office. 1981)

This book has colour photographs of many native grasses, many of them common to south-eastern Australia.

## Publications

### "Germination of Australian Native Plant Seed"

Langkamp, P. (editor) Inkata Press. Melb. & Sydney. 1987

A compendium of mining industry experience with the Australian native plant seed they have used for mine site rehabilitation. Includes an excellent chapter on the germination of Poaceae (Gramineae) - reproductive morphology, seedling development, seed dispersal, seed germination, establishment of native grasses and concludes that:

".. the direct sowing of suitable native grasses on disturbed land does offer advantages over the present practices of sowing exotic grasses and waiting for their natural replacement by invasion from surrounding areas .. (but) Much work remains to be done before firm recommendations regarding the harvesting, treatment and sowing of more than a handful of native grasses, can be made."

Appendices include a summary of the information published about the seed germination of native grasses, and a survey of native plant seed usage by the Mining Industry i.e. the species, collection method, amount in kg, cost (\$/kg) and the name of the mine. The native grasses that have been used include *Rottboellia formosa*, *Spinifex hirsutus*, *Stipa aristiglumis*, *Stipa* sp., *Thaumastochloa major*, *Triodia irritans*, *T. lanigera* and *T. wiseana*..

## Feature Plant

*Microleana stipoides* or weeping grass, has its major growth period in the summer time. Flowering and seed production occur following adequate growth any time from spring to late autumn and it's therefore classified as a yearlong green perennial.<sup>1</sup> It has a shallow rhizomatous habit, particularly when closely grazed or heavily mown. "Approx. 15 cm high in mown turf but 2 or 3 times that height in uncut situations."<sup>1</sup> However there would appear to be quite a range in the degree of rhizome and stolon production within the species.<sup>2</sup>

Erect "nodding" green inflorescences, becoming straw-coloured in the autumn. Mid-green foliage.

Hardy but prefers some shade and moist, reasonably fertile soils. Appears to be extremely responsive to high fertility.<sup>3</sup> Does poorly on dry, exposed sites.<sup>1</sup>

Regular mowing at 37-50 mm height produces a reasonable turf and *Microleana* has potential as a lawn in shaded situations.<sup>1</sup> Turf plugs would adequately establish a small lawn area i.e. 50-75 mm plugs at 300 mm spacings.<sup>1</sup> However, I think even smaller plugs than this would be adequate, providing the water was kept up to it, as for a normal lawn.

Has potential also as a pasture species.<sup>1,4</sup>

Peak harvesting period is January<sup>5</sup> though plants will flower anytime from spring to late autumn. Each individual seed is shed enclosed in the lemma, palea and two sterile lemmas, when it matures (see fig.1).

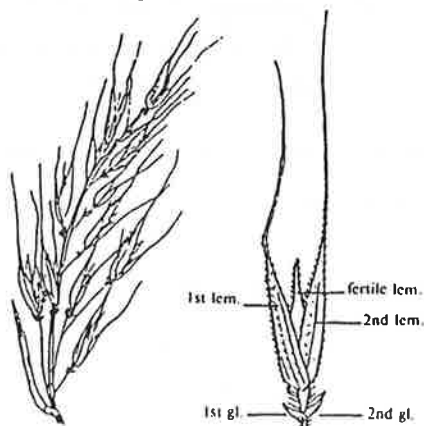


fig.1 Inflorescence and spikelet of *Microleana*

The seeds are quite large and about 6 mm long. Harvesting by hand is preferred<sup>6</sup> as harvesting with conventional harvesting machinery presents particular problems.<sup>2</sup> However there are machines that have been specifically designed to harvest native grasses, machines such as the reel harvester, which should solve these problems.<sup>7</sup>

**Dormancy or after-ripening period:** At least 2 months for 80-90% germination.<sup>8</sup>

**Germination** is high under nursery conditions (80-90%). Seed will maintain maximum viability for 2-3 years and will still be viable after 6-7 years.<sup>8</sup>

Sow in late winter/early spring and if sowing a large area ensure the site is free of winter and summer-growing weeds. It has been suggested that if the awns were removed from the sterile lemmas by light hammer milling then the resultant spikelets would run fairly easily through conventional sowing machinery.<sup>2</sup>

## References

1. Whalley, R.D. 1987. "Domestication programme for the native grass *Microleana stipoides* (Labill.) R.Br." In Domestication of Australian Native Grasses, Workshop Proceedings, Dept. of Ag., NSW.
2. Whalley, R.D.B. (pers. comm.) April 4th, 1989 - See Correspondence.
3. Vieira, A. 1980. "Grazing value of *Microleana stipoides* (Labill.) R.Br. on sheep camps on the Northern Tablelands of NSW and its responses to fertilizer when growing in a glasshouse." Dip. Sci. Agric. Thesis, Univ. of New England.
4. Lodder, M.S. (pers. comm.) Dec., 1986 CSIRO Div. of Plant Industry Black Mountain, Canberra. ACT

seed on Blotting Paper or cotton wool or Germinating pads to allow them to germinate and then planted in holes in the pots (potting mix) and watered gently.

The only method of collecting reliable seed is to collect it by hand. The way we have found successful is to place your hand over the spikelet, holding the stalk between your finger and thumb and gently pull away from the plant. Those seeds that are about to fall will come off in your hand. The seed needs to be stored in a paper bag and also allowed to dry naturally.

If you have difficulty you could send us some seed and we will try it for you. If it is at all possible (we) would appreciate some seed or 10 plants from the same site .. If you could date and give the site and send by post. I hope you will find this of help."

Doug Clark  
Dept. of Botany,  
Uni. of New England  
Armidale NSW 2351

November 11th, 1988

".. Enclosed are seeds of *Stipa eremophila* and *Danthonia caespitosa*, which were collected by an honours student of Rod Wells (Peter Orell) as a result of a project to compare rabbit and wombat feeding. The *Danthonia* seeds don't look very ripe but may be o.k. .. "

Frances Boreland  
School of Biological Sciences  
Flinders Uni., Sturt Road,  
Bedford Park S.A. 5042

November 17th, 1988

"Thanks for the brochure on the Grassland Revegetation Seminar .. I'm glad to see a growing interest in the use of grasses. Actually, you were on my list of things to be done .. because I wanted to let you know the results of the seed you sent me in late July. We were away overseas from mid-August to mid-September

but I sowed some before we left and the rest after we came home. I have been waiting for the last of them to germinate and have finally given up the *Stipa species*. They have had 3 months and there is no sign of them. Anyway, here is a summary of results (see table opposite):

I have had trouble germinating *Stipa* before - are they notorious for low fertility? I have just been given some seed of *S. elegantissima* so I hope that germinates - it is a beautiful plant. I was given plants and seed of *S. setacea* and that germinated very well, so I don't know what to conclude about them.

The warm weather plus some good rain here has produced a flood of tiny *Dichanthium sericeum* seedlings self-sown from last year, so I look like having an unplanned grassland of that one!

I have planted out plenty of *Themeda* this spring (1988), plus the *Agropyron* and I have *Stipa setacea* and *Poa australis* flowering at the moment and an unknown *Danthonia* collected at Rushworth (Victoria) last year. The *Poa labillardieri* and the three *Danthonias* are growing on and will be added to the collection. (The neighbours think I am mad - planting weeds!)

I am trying to establish an area of local plants - small species - lillies, patersonias, small herbs etc. and grasses. The enclosed species was growing in local bushland amongst those species and providing just the effect I want, but I think it is an *Aira sp.* Can you confirm it for me? If it is introduced, can you recommend a native species to do the same job? It needs to be small, light and delicate, so as not to overpower the other plants, and probably an annual which will self seed each year. .. "

Bev. Courtney  
3 Burswood Close  
Frankston Vic. 3199

(That grass is an *Aira species*, *Aira cupaniana*, native to Europe and Asia. Some of the *Panicum species* look very similar, for example, *P. effusum* or hairy panic. Per cent seed fill for a

5. Paget, Andrew. 1987. "The horticultural potential of Melbourne's indigenous grasses" *Trees & Natural Resources* 29(2): 2-6

6. Clark, Doug. (pers. comm.) October 20th, 1988 - see Correspondence.

7. Wotzko, A.

"New Harvester for Native Grass Seed" *Australian Parks & Recreation* - Nov., 1981

8. Whalley, R.D.B. (pers. comm.) March 8th, 1989 - See Correspondence.

## Seed Bank Report

The following grasses are in stock:

*Agropyron scabrum*  
*Chloris truncata*  
*Cymbopogon* sp.

*Danthonia caespitosa*  
*D. duttoniana*  
*D. geniculata*  
*D. linkii*  
*D. linkii* var. *fulva*  
*D. pilosa*  
*D. racemosa*  
*D. setacea*  
*D. tenuior*

*Dichanthium sericeum*  
*Dichelachne longiseta*  
*Enneapogon avenaceus*  
*E. nigricans*  
*Microlaena stipoides*  
*Poa labillardieri*

*Stipa drummondii*  
*S. elegantissima*  
*S. eremophila*  
*S. mollis*  
*S. nitida*  
*S. nodosa*

*S. setacea*

*Themeda triandra*  
*Triodia irritans*

The winter-growing grasses and the year-round growing species, such as the *Danthonias*, *Poa*, and *Microlaena*, are best planted now, in the autumn, after the first good rains. The summer-growing grasses are best sown late winter to early spring. Seed is available to members by sending a SAE (50c postage, 55c interstate). Remember that as with other banks, you will get the most interest out of our seed bank if you make deposits!

To seed donors: please keep seed lots separate i.e. seed of the same species but collected in different seasons/years and/or from different sites. Add a pinch or two of Derris dust to kill any insects and please remember to label your seed, including the date and place of collection, aspect, type of vegetation and any other useful information.

Thank you to past donors and to recent donors: Helen Bizzai, Frances Boreland, Bev. Courtney, Joan Gibbs, and Dr. Whalley.

## Correspondence

Dear Dermott ..

October 20th, 1988

".. We on the whole have not had problems with germinating *Microlaena stipoides*. I have about 300 plants growing which were planted at the end of last year. Some are seeding now. I would

have had about 90% germination. Your seed may have been a little old. The seeds must be kept moist but not too wet for too long. They may not like it too hot to start with .. You could place the

<u>Species</u>	<u>Sown</u>	<u>Germinated</u>	<u>Notes</u>
<i>Stipa pubinodis</i> Ironbark 85/86	30.7.88	None	
<i>S. mollis</i> Ironbark 85/86	30.7.88	None	
<i>Agropyron scabrum</i> Strathmerton. Nov.,86	30.7.88	?8.88	100% germination. All 3" tall on our return.
<i>Poa labillardieri</i> Aldara 85/86	28.9.88	15.10.88	Seven seedlings
<i>Danthonia setacea</i> Blackwood	15.10.88	26.10.88	Seven seedlings
<i>D. caespitosa</i> Aldara	15.10.88	28.10.88	12 seedlings
<i>D. pilosa</i> Ironbark	15.10.88	2.11.88	Five seedlings

*particular species will depend on its location; when the seed was collected i.e. early or late in the flowering season, or during the peak collecting period; and what sort of a year it was, for example, if it was a dry year % seed fill may be less than normal for that site - Ed.)*

December 6th, 1988

".. Now my progress with propagation. I had tremendous success with *Danthonia sp.* which I planted approx. May, June. After germination I pricked the seedlings into individual tubes and they all grew very well and I now have them in our garden and flowering.

I planted seeds of *Neurachne* about August. However, they didn't seem to like the disturbance of being pricked out into individual tubes and I want to plant seeds direct into tubes late summer, and see how they go. The plants I have now all seem to be struggling. The same thing applies to my propagation attempts with *Enneapogon* - I have found that plants that are pricked out seem to like cool weather to get established in their new tubes or pots.

I had good results germinating *Stipa nodosa* (in individual tubes) during the last couple of months (since 6.12.88). I planted a few seeds of *Themeda*, but none germinated. I have other grass seeds I would like to propagate, but for the

moment they will have to wait. I am also propagating South Australian indigenous plants to plant in our new garden, and time and space are limiting factors. .. "

Helen Bizzai  
P.O. 386, Gawler  
South Australia 5118

February 28th, 1989

"Many thanks for the extra information on hybridization. I have decided not to scatter grasses willy-nilly through the garden, but to keep each species to a definite area i.e. 5 or 6 plants to, say, a square metre or so (planted amongst the other plants). Probably they will self-seed everywhere and complicate the issue, but I will worry about that when it happens.

I have put out the three *Danthonias* from the seed you sent me (*D. setacea*, *D. caespitosa* and *D. pilosa*) and also many plants of a local *Danthonia sp.* (don't know which one!).

I collected seed of three other local *Danthonias* this summer, and also two other *Danthonias* and some *Poa sp.* from the Kosciusko Nat. Park.

It is going to be a busy year with daisies, grasses and other species. I have about 100 packets of seed to be sown so far!

The *Dichanthium sericeum* really looks lovely at the moment. It has self-sown in so many spots

and even the neighbours (the roses and rhodies brigade!) are admiring it.

I had some country SGAP people visit the other day, and they commented on how natural the garden looked with the grasses scattered amongst the other plants. I am really happy with the effect.

I volunteered to do the program of guest speakers for our local SGAP group this year, and, (as a present to myself), asked Andrew Paget to talk to us. He is due next month and wild horses won't keep me away from the meeting!

Can you tell me if there are any other Study Group members in my area? (Mornington Peninsula or Melbourne's eastern suburbs) .. I would like to contact them with a view to meetings, botanising, field trips, etc.

You mentioned ads. in the newsletter. I don't see why not, especially if they are for nurseries specialising in grasses. A bit of extra income would be handy too, I imagine.

I have enclosed seed collected from my garden this spring/summer season. I have no particular requests for seed, but if there is anything you would like grown for seed collection or trialling, please send it to me.

**Bev. Courtney**  
**3 Burswood Close**  
**Frankston. Vic. 3199**

March 8th, 1989

"Thank you for your second letter concerning *Microlaena stipoides* dated 22nd February. Doug Clark had showed me your original letter and his reply. It seemed to me that he had covered most of your questions pretty adequately .. you said your seed from 1985 might have been a little old. This seems to me unlikely because we have kept seed for 6 or 7 years and still got adequate germination. On the other hand, I like to use seed that is about 2 to 3 years old as then it usually retains maximum viability.

We find that seed usually needs 2 months storage before germination is up around 80 or 90%. We have no good data for this, but we often find with

very fresh seed that the germination is reduced. All being well, I will collect some data on this aspect next summer.

If you are at all doubtful about a particular seed sample, then the best way is to germinate it on top of either filter paper or blotting paper or perhaps cotton wool, inside the petri dish. You don't want to have it too wet or the seed will rot. Then you can see exactly what is happening to each seed and you can pick out the germinated ones when the radicle is about a centimetre long and carefully plant them into pots with the coleoptile upwards. You can get about 99% survival doing it this way provided you don't damage the seedling.

I would very much appreciate having some seed of *Microlaena stipoides* from South Australia if you could send me some in the late spring when the seed has ripened. Almost all the samples I have come from the Northern Tablelands and I would be interested to see if there is any difference in summer dormancy between ours and the material collected in southern Australia. I am enclosing a small packet of seed collected about 50 kilometres north-east of Armidale in 1986. I will also put some of this seed out on a petri dish now and will let you know if it does not germinate. I have no reason to suspect that it won't. Please let me know if I can be of any further assistance."

**R.D.B. Whalley, Senior Lecturer**  
**Department of Botany, Uni. of New England**  
**Armidale. New South Wales. 2351**

March 14th, 1989

" .. concerning the list of rusts and smuts on various grasses that I sent you. You mention in your letter that several of the grass species in my list now have different names according to the Flora of South Australia, vol. 4, 1986. The names that I have used in the list that I have sent you are those that are used in the various sources from which I have compiled these lists, including references to the occurrence of plant diseases in other states and specimens filed in our herbarium



here at Rydalmere. For this reason I would think it unwise to make any changes to the hosts given in the list I have sent you, and I would prefer them to be published just as they are. However, I think it would be a good idea in view of the comments in your letter, to add a note to my list which reads as follows:-

The host names given in the above list are those used in the various literature sources and on the specimens from which the lists were compiled. Some of the host names may now be known under different names.

.. I should mention that some of the name changes you mention in your letter are not necessarily accepted by other botanists. For example, the first name you list, *Chloris acicularis*, which you say is now *Enteropogon acicularis*, is not accepted as such in the census of New South Wales plants, where *Enteropogon acicularis* is entered as a synonym of *Chloris acicularis*. In view of the various differences in taxonomic opinion concerning grass hosts, and as the specimens will need to be re-examined to determine the hosts accurately, I think that the note I suggest is the more satisfactory way of handling it at present."

**John Walker, Principal Scientist  
NSW Agriculture & Fisheries  
Biological and Chemical Research Institute  
Private Mail Bag No. 10, Rydalmere. NSW  
2116**

April 4th, 1989

"Thank you for your recent letter concerning *Microlaena stipoides*. I will do the best I can to answer your questions although I can't be positive about the answers to several of them.

Question 1:

There seems to be quite a range in the degree of rhizome and stolon production from *Microlaena stipoides* collections from this part of the world (New England). However, we do not have any that have long rhizomes and stolons similar, for example, to couch grass. If the material that you

have produces long rhizomes and stolons then I would be particularly interested in obtaining some seed when you have some available.

Question 2:

The problem with harvesting the seed of *Microlaena stipoides* using conventional harvesting machinery is that the abscission layer causes each individual spikelet to fall when the seed is mature (see fig.2).

Therefore, if you try and harvest a crop of seed before the seed falls, then most of the spikelets you collect will contain immature seeds or no seeds at all. If you wait for the seeds to mature before harvesting,

then you won't have any crop at all! The abscission layer therefore does not obstruct harvesting machinery, it simply causes the seed to fall so that you can't harvest mature seed.

Question 3:

I don't know that any particular brand of seed harvesting equipment has been used to attempt to harvest *Microleana stipoides* seed but the problem remains of getting a good sample. What we really need is a variety that does not shed its seed and then one is in a position to experiment with different types of seed harvesting machinery.

Question 4:

I would suggest that if the awns were removed from the sterile lemmas by light hammer milling then the resultant spikelets would run fairly easily through conventional sowing equipment.

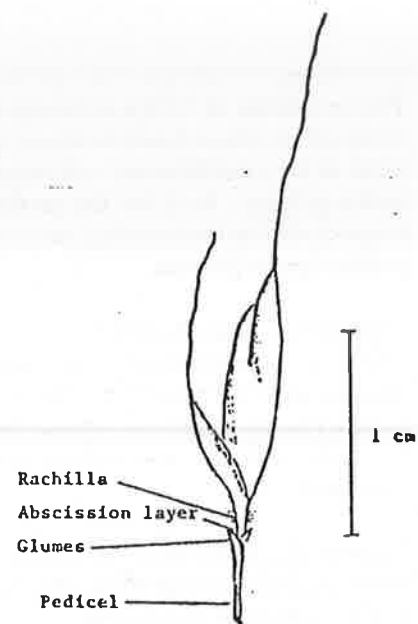


fig.2 Spikelet of *Microlaena* showing the position of the abscission layer.

We have not tried this as yet because it is so difficult to get a large enough sample before we have solved the seed harvesting problems.

Thank you again for your letter and I would appreciate some seed of some local South Australian material as soon as you have some spare available.”

**R.D.B. Whalley**

**This newsletter is for the exchange of observations and practical details between people interested in the establishment and management of native grasses - be it for the garden, or, on a larger scale, for landscaping, revegetation, seed production or pasture.**

**Fees are \$5 a year, payable in June. However, to become a financial member one must also be a member of SGAP (the Society for Growing Australian Plants). Members receive the quarterly newsletter and have access to the study group's seed bank.**

**Contributions, illustrations and/or ideas are welcome and material for publication and enquiries should be directed to:**

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