DEPARTMENT OF
PRIMARY INDUSTRIES

Chilean needle grass

Slasher cover demonstration day **November 2009**

Slasher cover Demonstration day November 2009

Slasher cover uptake project

Effect of flupropanate on non target species

Correlating weeds in hay project

Biodiversity impacts of Chilean needle grass

Compiled by Charles Grech, Holly Bennett, Sandra Weller

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Chilean needle grass field day fact sheets November 2009

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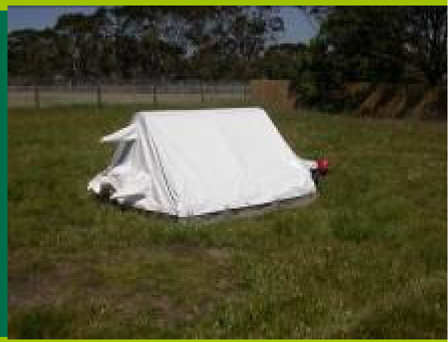
Slasher cover comparison trial



Slasher cover demonstration day November 2009

<u>SUMMARISED TRIAL PROTOCOL</u>

Charles Grech (DPI Weed Sciences) & Sandra Weller (Ballarat Uni)

Hypothesis/basis

It has been observed that the seeds of Chilean needle grass may be spread by the use of machinery slashing roadsides infested with this weed. Modification of slashers by the addition of a cover or deck fans which can prevent seeds and/or seed heads settling on the top of the slasher appears to be effective. Comparing the relative effectiveness of each type of slasher modification can provide information to assist with the choice of a suitable modification type, depending on the user's needs and/or budget.

Aim

To evaluate the effectiveness of slasher cover compared to uncovered slasher and the use of a slasher fan.

Trial layout/Setup

Field trial at 'The Elms'
7ft Howard 3pl slashers (field operating speed)
Supplied by Hume City Council Parks Dept.
Supplied by Macedon Ranges Shire Council (c/o Hume Turf)
4 reps (randomised block) of 5m wide x 100m long slashing lanes.

Treatments

1. no cover & no fan
2. slasher cover
3. slasher fan (on whilst operating)

Data collection

Collect and quantify all trash from deck of slasher after working at operating conditions in Chilean needle grass infested pasture.
Sweep and catch using tarps and then bag for weighing/sorting
To be done after each lane has been cut for each slasher

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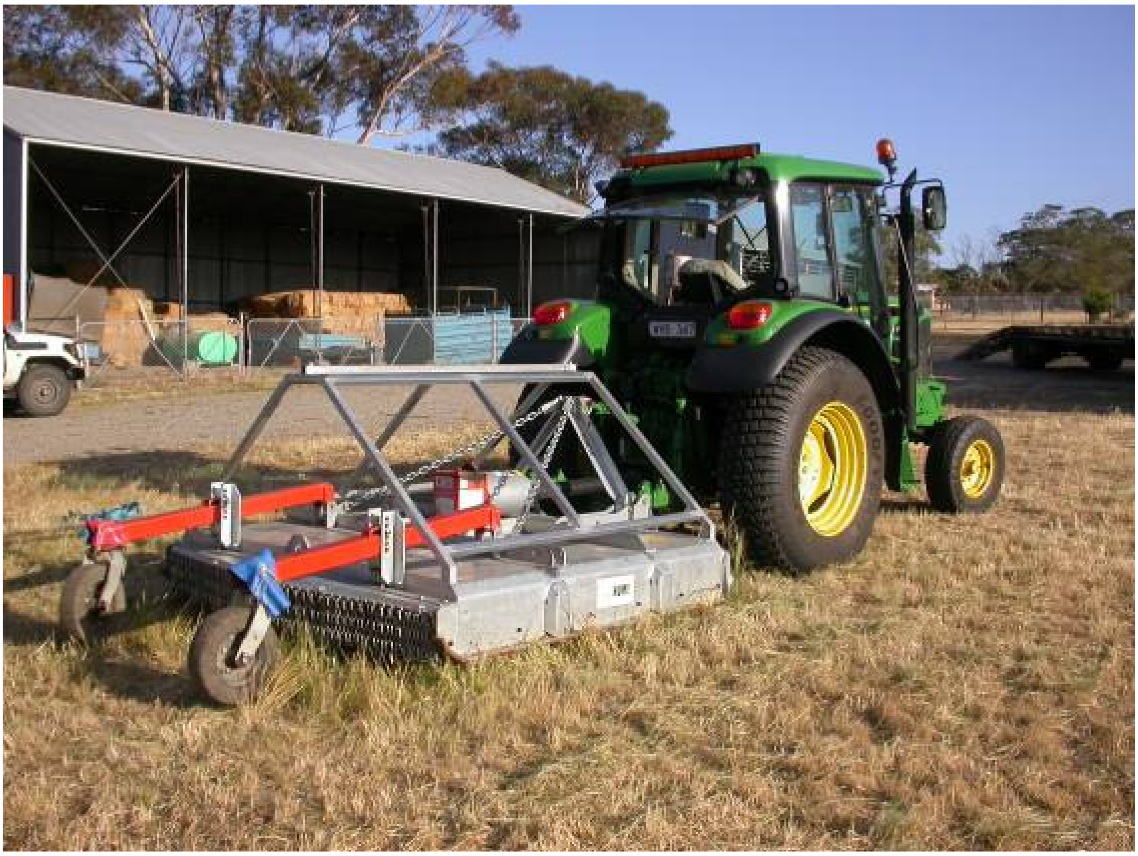
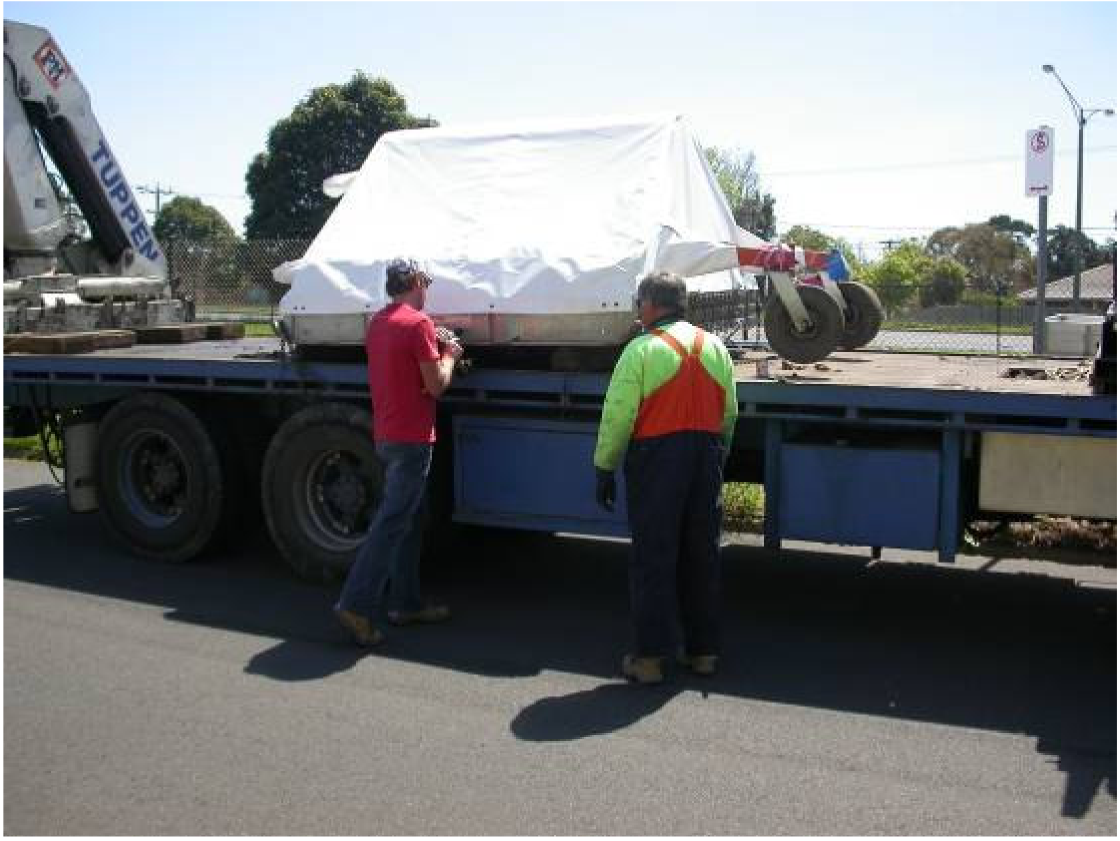
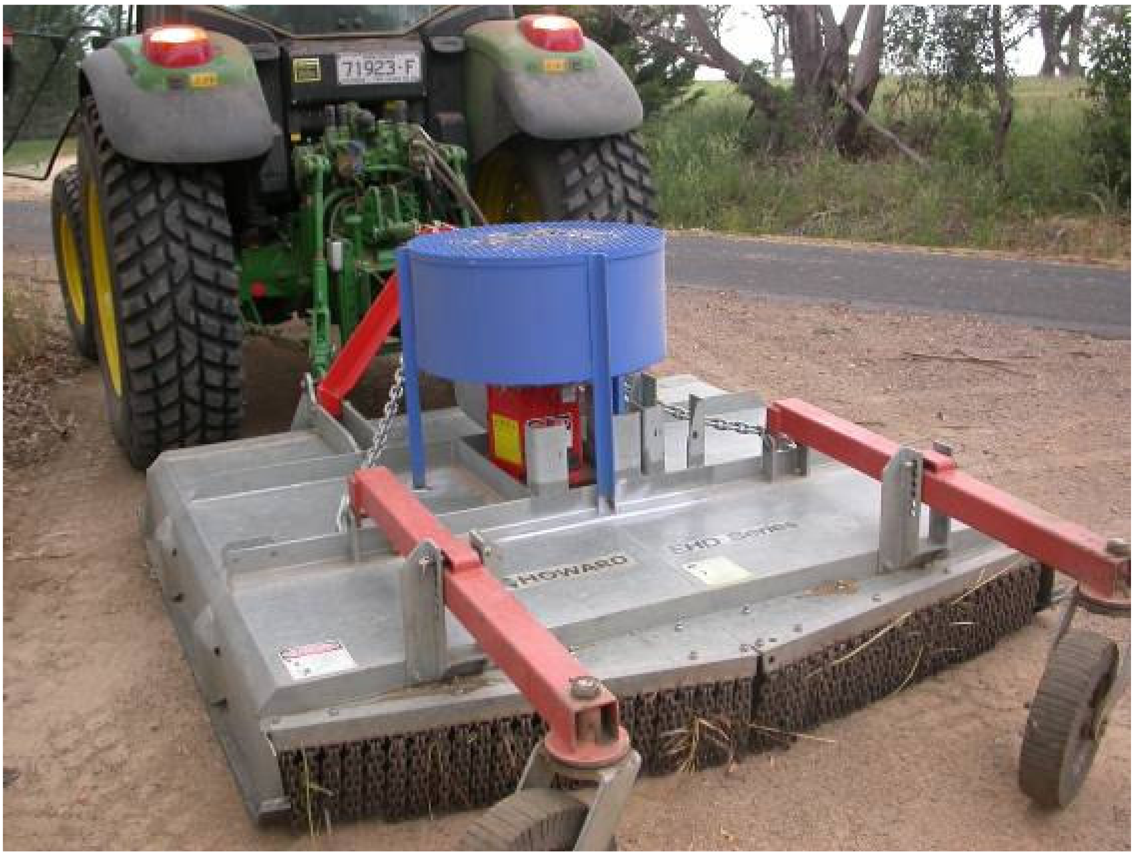
	Slasher Cover	Slasher Fan
Basis of operation	Physical barrier	Air Movement produced by hydraulically operated fan
Power requirements	none	Hydraulic remotes
History of concept	RMIT engineering project 2005	Operation in Queensland since 2006
Construction **Parts**	Steel frame Canvas cover	Hydraulic motor Hydraulic hoses Fan Blade Steel cowling
Process	1. Transport of slasher to steel fabricator 2. Weld frame to slasher deck 3. Transport of slasher to canvas fabricator 4. Measure & Fit canvas to slasher frame 5. Transport return	1. Purchase fan, motor, & Hoses 2. measure slasher components 3. Weld cowling at steel fabricator 4. Weld components on frame to slasher deck
Cost considerations	Transport and time costs associated with physically taking to fabricators and costs of having slasher offline **Est project cost $3500**	Mechanical components may require periodic maintenance **Est project cost $2500**
***POTENTIAL* Practical considerations**	Tearing of cover UV damage (material dependant) Longevity of mounts Longevity of frame/ damage from vibration ***Proof of concept model*** Reduced line of vision for operator to rear Gear box access Gear box temperature Fitment to slasher/Quick fit	Risk associated with moving parts (Grass slasher!) Risk associated with hydraulic hoses Minor noise consideration Damage to mount from vibration ***Proof of concept model*** Physical damage from objects Partial reduced line of vision for operator to rear Colour selection! Gear box access
Prof of concept model fitted to	7ft Howard 3pl slasher from Hume City Council	7ft Howard 3pl slasher from Macedon Ranges Shire Council (c/o Hume Turf)
Manufacturer for proof of concept	MORFAB Engineering	MORFAB Engineering



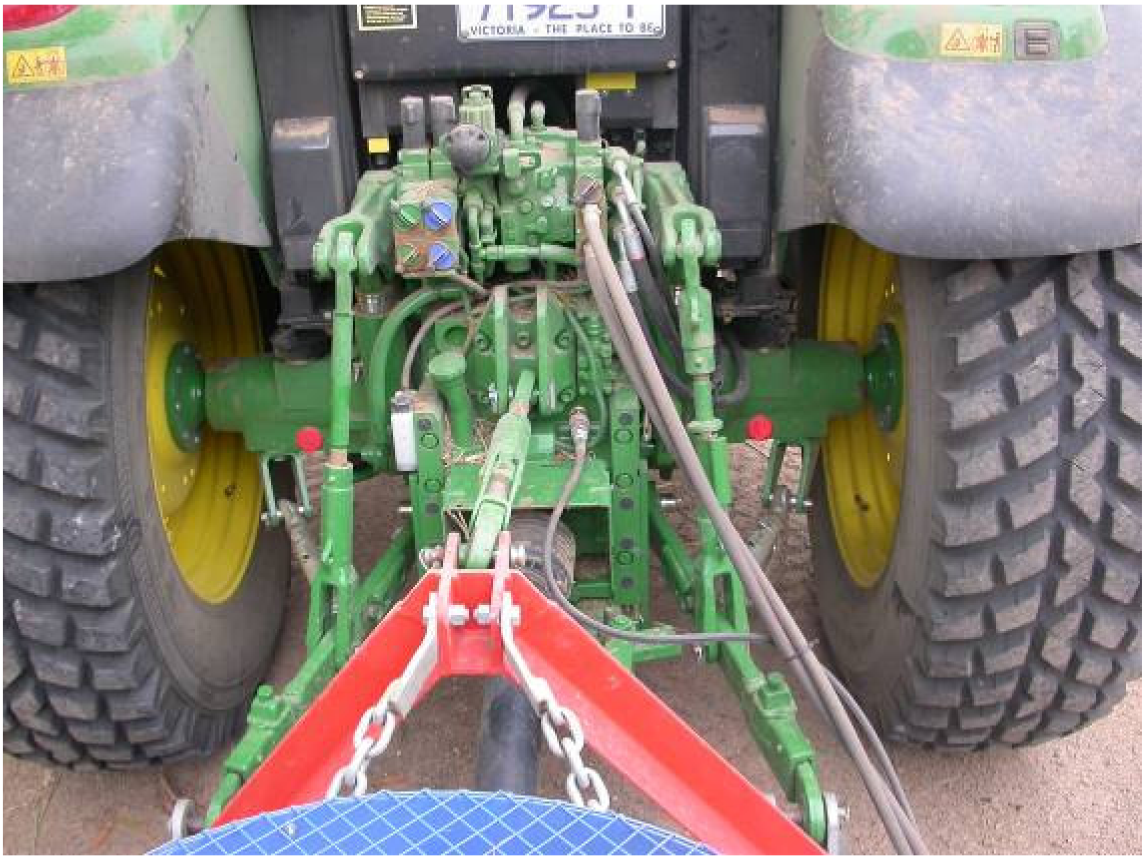
Welded frame completed on slasher (for cover)



Transporting slasher after canvas cover fitting

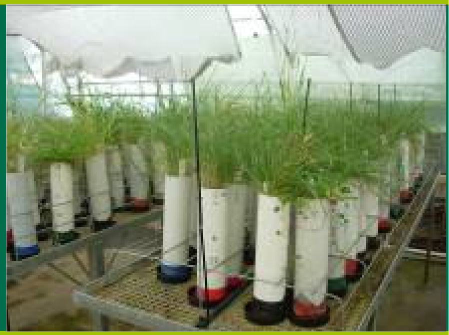


Welded Slasher fan



Hydraulic connections for slasher fan

Effect of flupropanate on non target species - Glasshouse



Slasher cover demonstration day November 2009

<u>SUMMARISED TRIAL PROTOCOL & FINDINGS</u>

Charles Grech, David McLaren (DPI Weed Sciences)
Holly Bennett, Roger Cousens (UniMelb)

Hypothesis/basis

Flupropanate is marketed as a selective chemical, although trials have shown that it has a degree of selectivity and damages non target grass species.

Recent changes to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) has included the Victorian volcanic plains, and as such has restricted the use of flupropanate in native grass areas (including public land). This has been identified by Biosecurity Victoria as a gap in the policy related to managing the volcanic plains for weeds – especially Serrated Tussock.

Aim

*To evaluate the selectiveness of flupropanate for **mature** native grasses and improved grasses at different herbicide rates*

Data collected

Plant die back or death after flupropanate application (foliar and soil spray combined)

Measurements pre and post spraying (weekly intervals), including

1. *Alive/browning off/dead (totally brown)*
2. *Leaf lesions/herbicide burn (for foliar sprayed plants)*
3. *Plant height*
4. *Tiller numbers*

destructive harvest – approx 4Month After Application

1. *leaf area*
2. *shoot mass*
3. *root length*
4. *root mass*

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Trial layout/Setup

Glasshouse trial, DPI Frankston.

- 2 Plants transplanted into 'pipe pots' filled with sterilised 'paddock soil – NW Melbourne'(30cm deep pots)
- Acclimatisation period (~2 weeks)
- Sprayed via track sprayer
- Overhead sprinkler irrigation

4 replicates (randomised complete block design) 5 application rates

Table 1: Experimental Treatments

Treatment Number	Treatment
1	0.0 L/ha (0 g a.i./l)
2	0.5 L/ha (372.5 g a.i/l)
3	1.0 L/ha (745 g a.i./l)
4	1.5 L/ha (1117.5 g a.i/l)
5	2.0 L/ha (1490 g a.i./l)

Table 2: Species

Number	Common Name	Scientific Name
1	Windmill Grass	*Chloris truncata*
2	Kangaroo Grass	*Themeda triandra*
3	Poa Tussock	*Poa labillardieri*
4	Wallaby Grass	*Austrodanthonia duttoniana*
5	Spear Grass	*Austrostipa bigeniculata*
6	Lemon Beauty Heads	*Calocephalus citreus*
7	Perennial Ryegrass	*Lolium perenne*
8	Subterranean Clover	*Trifolium subterraneum*
9	Cocksfoot	*Dactylis glomerata*
10	Phalaris	*Phalaris aquatica*
11	Chilean Needle Grass	*Nassella neesiana*
12	Serrated Tussock	*Nassella trichotoma*

Results - Flupropanate @ 0.5l – 2l/ha rates

<u>Significantly affected (e.g. plant death)</u>

- *SERRATED TUSSOCK*
  - Effectively killed up to 2l
- *Sub clover*
  - Damaged by low rates

<u>Transient decline (Growth rate, vigour, tillers)</u>

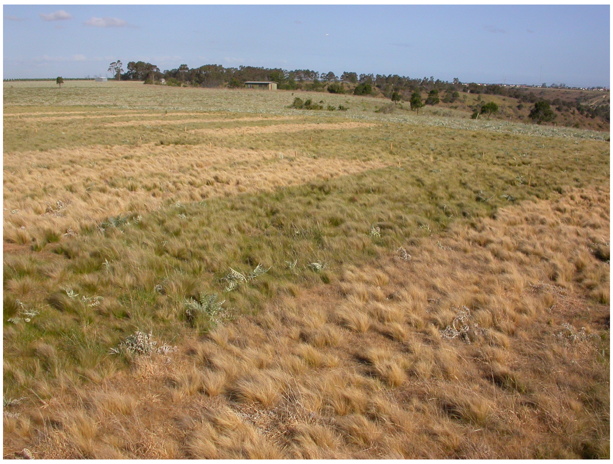
- CHILEAN NEEDLE GRASS
- Phalaris
- Cocksfoot
- Perennial ryegrass
- Kangaroo grass
- Wallaby grass
- Spear grass

Implications (Glasshouse component)

Flupropanate did not significantly damage listed non target species

Contrary to perceived effects of damage

- EPBC implications
- DSE flora fauna



Future studies to validate findings

Flupropanate in different soil types

Field studies of intact soil profiles

Larger range of native species

Environmental stress factors

Natural rainfall

Multiple seasons

Field sites – commenced Sept 09

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Correlating weeds in hay

Slasher cover demonstration day November 2009

Current PhD studies on fodder and Chilean needle grass:
Hypothesis/basis

Dispersal of *Nassella neesiana* or Chilean needle grass via the manufacture and movement of hay bales is becoming an increasing problem for rural Victoria. This noxious weed has economic, environmental and animal welfare impacts. The seeds or other propagules cannot be sold or traded but may be included with hay harvested in areas of infestation. A relatively simple and cost effective technique to test hay bales that have been harvested in areas of known contamination for the presence of seeds needs to be developed.

Aim
To evaluate the correlation of percentage cover in paddock with seed that can be recovered from bales.

Trial setup

- Establishment of percentage cover of weed prior to harvest and seed crop (seeds per m^2).
- Set up and mark out harvesting lanes for amount of area that will yield required amount of pasture for each concentration and adding clean hay as needed to make up the bulk of the bale as required.
- Baling of infested paddock and manipulation of percentage of weed in bales to simulate different percentage covers of weed.
- Machinery hygiene studies to evaluate how much seed is caught up in and on machinery
- Coring of bales to recover seed

Treatments
Manipulation of concentration of weeds in bales at harvest to obtain differing concentrations of seeds in bales for correspondence of weed coverage with seed found in bales.

Concentration of weeds from paddock	0%	25%	50%	75%	100%
Manipulation required	Use 'clean' bale, weed-free	Mow lane 2.5 m wide, add balance from clean bale, rake and bale	Mow lane 5 m wide, add balance from clean bale, rake and bale	Mow lane 7.5 m wide, add balance from clean bale, rake and bale	Mow lane 10 m wide, rake and bale

Data collection

- Percentage cover of the target weed and the size of the potential weed seed crop before harvest.
- Recovery of seeds from bales by core sampling.
- How much of the seed is caught up in and on machinery used to harvest hay – mower, hay rake, baler.