

A photograph of a field of serrated tussocks. The grasses are a mix of green and brown, indicating some dryness. The field extends to a flat horizon under a clear blue sky with a few wispy clouds. A single tree is visible on the horizon line.

CASE STUDY
SERRATED
TUSSOCKS

Paddock at Berrima, NSW (December 2005)

A Serrated Tussock Field Day was organized by the DPI Goulburn NSW, at Berrima, NSW on the 7th of December 2005.

During the Field Day, the author of this report was invited to demonstrate the Swingwiper and do Field Trials afterwards, targeting Serrated Tussocks using two different chemicals in a paddock with several grass species including Microlaena and clover.

CHEMICALS TESTED

1) *Glyphosate (360)*

Single wipe at a rate of 2.5 Litres/Ha.

This rate was achieved with a 100% weed density setting on the Swingwiper controller putting out a calibrated amount of 50 Litres/Ha (at travelling speeds between 6 and 14 Km/Hr) and a mix of 1 litre of chemicals in 19 litres of water. Wetter Tx was added at a mixing ratio of 200 ml per 100 litres.

Double wipe at a rate of 5.0 Litres/Ha.

This included a second wipe in the opposite direction with the same mix and settings.

Results: the first browning off signs looked promising but re-growth took over, most probably due to:

- The drought conditions after wiping (no sap flow taking the chemicals into the root system)
- The loss of chemicals being wiped onto the dead seed heads
- Not being able to wipe chemicals effectively onto the green tussocks

2) *Flupropanate*

Single wipe at a rate of 2.0 Litres/Ha.

This rate was achieved with a 100% weed density setting on the Swingwiper controller putting out a calibrated amount of 50 litres/Ha and a mix of 1 litre of chemicals in 24 litres of water. Wetter Tx was added at a mixing ratio of 200 ml per 100 litres.

Results: as there were very dry conditions after wiping, we expected to have to wait much longer than the 3-4 months before seeing any results.

This was not the case; a very good kill of the Serrated Tussocks showed already after 3 ½ months (see pic 3).

WIPING CONDITIONS

Weather: Sunny, 29 degrees, 23% humidity, windy 16-22 Km/Hr during wiping.

Weed condition: Serrated Tussocks green with dead seed heads (see Pic 1), estimated density 85-90%.

Pasture: Several grass species including *Microlaena* & clover (grazed down).

Wiping speed: Between 10 and 11 Km/Hr on a Quad Bike, using a QS-2.2 Swingwiper.



*Picture 1 shows pasture including *Microlaena* and clover, infested with Serrated Tussocks during wiping (6 December 2005).*

This attempt for weed control was done during the worst time of the year:

- Extreme dry conditions
- Prolonged windy periods
- Serrated Tussocks with loose seed heads

The Berrima site shown in this Case Study was prone to high winds for the last three months, eliminating boom spraying as an option due to spray drift.

Wipers are able to operate under these windy conditions because of their design. But with other wipers the dead and loose seed heads will build up on the applicator and/or other parts, preventing continuous wiping. However, because of its design the Swingwiper was not affected and kept operating.

RESULTS

- Flupropanate worked very well, but Glyphosate did not.
- Good pasture cover all the way up to the dead Tussocks. Spot spraying would have left bare patches around the Serrated Tussocks, a seedbed for more weeds to come.
- The Flupropanate acted very fast at a rate of 2 Litres/Ha in drought conditions. This could indicate that there was an “overdose” of chemicals.
- Wiping with Flupropanate must be done during dry periods* as 100mm of rain leaches the chemicals from the soil making it ineffective.

* Check the label for duration of dry periods.

- The real weed density of Serrated Tussocks is much lower than the estimated 85-90%. The weed density in this spot could easily be around the 50%, which could mean a possible reduction in chemical use of 50%, resulting in a possible saving of around \$30/Ha on chemicals.
- The wiped paddock section is well eaten out.



Picture 2 shows the results after 3 ½ months using Flupropanate

This is the situation we notice repeatedly after wiping, the grazing animals “flog” the area, which has been wiped, “ignoring” the good pasture in the remainder of the paddock.

The explanation we have is two-fold:

- 1) The increased microbial activity in the soil, breaking down the root system of the Serrated Tussocks, is feeding the pasture species.
- 2) Pasture is getting more moisture, as the dead Serrated Tussocks do not take up moisture anymore.

As illustrated in Picture 3, the Serrated Tussocks are almost completely eradicated (notice the heavy stands of Serrated Tussocks missed by the operator).



Picture 3 shows the results 24 months after a single wipe with Flupropanate

PASTURE MANAGEMENT

Pasture management plays a very important part in weed control.

In this case, it shows that the paddock was not over-grazed and good pasture cover was able to keep out the weeds.

Over time, this management will result in a gradual exhaustion of the weed seeds, which also means that follow up weed control can be at prolonged intervals using only a small amount of chemicals.

When weed patches are not too big, good pasture will move into the bare patches.

When weed patches are large and quite dense, the mulch from the dead Serrated Tussocks will cover the bare patches protecting it from weed invasion, and allowing the surrounding grasses to re-invade the un-vegetated area over time.

In case of mulch removal from large and dense dead Serrated Tussocks, the bare areas have to be re-seeded for sufficient pasture cover to prevent further weed invasion.

COST ANALYSIS: Wiping costs VS Boom spraying costs

Applicable for multiple rooted weeds like Serrated Tussocks, African Love Grass, Giant Parramatta Grass, Giant Rats Tail Grass, Poa Tussocks, etc.

FACTS AND FIGURES (to be adjusted for costs and local conditions):

Glyphosate 360

Costs: **\$6.00/litre**

Rate for 100% weeds: **4 L/Ha** (double wipe)

Flupropanate 745

Costs: **\$30.00/litre**

Rate for 100% weeds: **2 L/Ha** (single wipe)

Wiping costs = \$52.00/Hr (owner operator)

- Operating speed: **10 Km/Hr**
- Effective wiping width: **2.6 m** (Swingwiper model QS or QG 2.8 with a 0.2m overlap)
- Coverage: **2.6 Ha/Hr**, resulting in a cost of **\$ 20.00/Ha** (single wipe)

Boom spraying costs = \$20.00/Ha (owner operator)

COST CALCULATIONS

Weed Infestation	COSTS PER HECTARE Swingwiper / Glyphosate Chemicals + wipe application		COSTS PER HECTARE Swingwiper / Flupropanate Chemicals + wipe application	COSTS PER HECTARE Boom Spray Flupropanate Chemicals + boom application
	Double	Single	Single	
10%	\$2.40 + 2x \$20 = \$42.40	\$21.20	\$6.00 + \$20 = \$26.00	\$60 + \$20 = \$80.00
20%	\$4.80 + 2x \$20 = \$44.80	\$22.40	\$12.00 + \$20 = \$32.00	\$80.00
30%	\$7.20 + 2x \$20 = \$47.20	\$23.60	\$18.00 + \$20 = \$38.00	\$80.00
40%	\$9.60 + 2x \$20 = \$49.60	\$24.80	\$24.00 + \$20 = \$44.00	\$80.00
50%	\$12.00 + 2x \$20 = \$52.00	\$26.00	\$30.00 + \$20 = \$50.00	\$80.00
60%	\$14.40 + 2x \$20 = \$54.40	\$27.40	\$36.00 + \$20 = \$56.00	\$80.00
70%	\$16.80 + 2x \$20 = \$56.80	\$28.40	\$42.00 + \$20 = \$62.00	\$80.00
80%	\$19.20 + 2x \$20 = \$59.20	\$29.60	\$48.00 + \$20 = \$68.00	\$80.00

COMMENTS

- 1) As the above table shows, chemicals costs play an important part in the overall costs for wiping. It is therefore important to use:
 - A chemical efficient weed wiper with an even chemical output over full wiping width when doing contour wiping (note that wick wipers use more chemicals than rotating wipers to achieve the same results).
 - A chemical controller that is able to change the chemical output for various weed densities at pre-set rates in Litres/H, and allows for re-adjusting the chemical output for various operational speeds.
- 2) Wiping 80% or less weed infestation gives the pasture a chance to invade the wiped, weed-mulched area.
- 3) Pending circumstances, putting in new pasture could be a better option with weed infestations over 80%, combined with use of a Swingwiper to control the newly emerging weeds.
- 4) Wiping with a Swingwiper is cheaper* than boom spraying. This cannot be said of other wipers, as there is no certainty of chemical output during wiping.
- 5) Using Glyphosate for wiping becomes attractive with weed densities above 55% (weeds have to be actively growing to be effective). Added advantage is the **NO With Holding Period (W.H.P.)** for animals.
- 6) After the initial wiping, wiping out a high density of weeds, the remaining smaller weeds can often be wiped successfully in a single wipe using Glyphosate. This not only changes the table above in favour of Glyphosate, deducting \$ 20.00 / Ha plus half the chemical costs, but also has the added advantage of a **NO W.H.P.** for animals.

* As table above shows, this is true for all weed densities. However, only in case of 100% weed density and using Flupropanate, the costs for weed wiping would be the same and not cheaper as the costs for boom spraying.

- 7) Using Flupropanate for wiping “bushy” weeds becomes attractive under a weed density of 55% and can be done anytime unless high rainfall. It becomes especially attractive at very low weed densities. Added advantage is the two week W.H.P. for wiping instead of the four months for Boom Spraying using Flupropanate.
- 8) Wiping does not have the spray drift problem of Boom Spraying causing over and/or under spray, which can cause the stunting/killing of non-target vegetation and/or reduced results.
- 9) Wiping chemicals onto weeds does have less impact on good pasture than boom spraying. Confirmed by a scientific field study that showed a higher weed concentration in boom sprayed plots than in a Swingwiper wiped area.

RECOMMENDATIONS

- Under these conditions (drought), we recommend the use of Flupropanate for Serrated Tussocks and not Glyphosate. Do not use Flupropanate during “high” rainfall periods as 100 mm of rain can leach the chemicals from the soil (read the label for conditions of use). Use Glyphosate only when weeds are actively growing and test for effectiveness** first, with several rates for single and double wipe, before wiping large areas.
- Lower chemical rates for Flupropanate needs testing, by changing the mixing ratio or the weed density setting on the controller, as the rate of 2litres/Ha achieved a very quick result.
- Adjust table above for latest costs and decide / check for the most economical way pending conditions, i.e. what chemical to use with single or double wipe, at specific weed densities.
- Good grazing management like rotational and NO over-grazing, needs to be in place for pasture to out-compete new emerging weeds, gradually exhausting the seed bank.
- Do not ‘spray top’ weeds, as weeds are prone to become chemical resistant especially when using lower application rates.
- Tackle the weed problem whenever you can, but if possible wipe out the weeds before they can produce fertile seeds.
- If possible, start wiping early during the pasture-growing season so good pasture is able to take over, with the right grazing management in place, and prevent new weeds from germinating.

** Very good results are also repeatedly achieved wiping many species of multiple rooted weeds like Giant Parramatta Grass, several species of African Love Grass, Whiskey Grass etc., when using Glyphosate 360 in a 1 in 25 mix, with a Swingwiper.



**Same paddock as front page at Berrima, NSW,
24 months after a single wipe with Flupropanate (December 2007).**



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