



Fatty Acid Trial - Final Results

Tauranga City Council

March 2016

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1. Introduction

A weed is categorised as any plant [useful or not] growing in the wrong place.

In order to keep our walkway surfaces weed free we need to remove these unwanted plants.

Some methods are:-

- Hand weeding
- Steam
- Chemical control

Hand weeding of walkways would be impractical and incredibly expensive.

Steam has advantages and disadvantages which could be further investigated.

This leaves chemical control which this trial will address.



2. Methodology

Four tracks have been chosen for this trial.

Two are in the Judea network and one of these will be sprayed with a product called Organic weed free made up of pine oil and fatty acid. The other track will act as a control and will be sprayed with Glyphosate 360 as per our usual regime.

The same trial will be carried out at Topaz in Papamoa with the waterway acting as a buffer between the control and the trial areas.



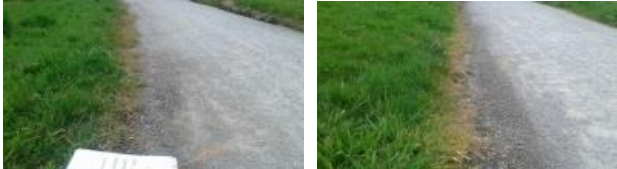

Each track will be photographed and observations recorded before and after each application.

Tracks

- Judea trial track, from the bottom of the Kingswood Road steps to the pedestrian bridge
- Judea control track, from the bottom of Novella, around Waikareao Estuary, to the beginning of long boardwalk
- Papamoa trial track, west side of Topaz stormwater drainage
- Papamoa control track, east side of Topaz storm water drainage



3. Table of applications

| JUDEA | |
|--|---|
| ORGANIC WEED FREE | GLYPHOSATE 360 |
| <p>Sprayed 9/10/15 - 10am cloudy 15deg. 1-15 mix = 30 litres water. 2 Litres concentrate</p>  <p>Inspection 12/10/15 Very little burn off. Some partial burning on clover.</p>  | <p>Sprayed 9/10/15 10am cloudy 15deg. 1-100 mix = 30 litres water. 300ml concentrate</p> <p>Inspection 17/10/15 70 % burn off after 1 week</p>  |
| <p>Sprayed 15/10/15 - 7.30 am fine 15deg. 1-10 mix = 50 litres water 5 Litres concentrate</p> <p>Inspection 17/10/15 - 80 % burn off</p>  | |
| <p>Sprayed 2/11/15 - 7.30am sunny 15deg. 1-10 mix = 40 litres water. 4 litres concentrate</p> | |



Inspection 4/11/15

Still not 100% burn off. Only partial clover burning.



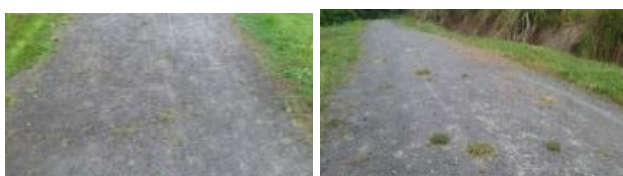
Inspection 4/11/15

Small amount of new growth. No clover burn off.



Sprayed 16/11/15

3.5 litres concentrate. Big weeds growing back



Inspection 16/11/15

Some regrowth after 6 weeks. No clover killed.



Sprayed 30/11/15

40 litres water. 4 litres concentrate.



Inspection 2/12/15

Needs re-spray. 8 weeks since last spray.





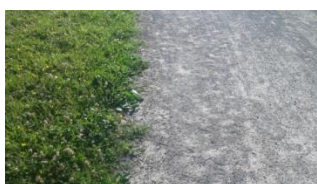
Inspection 2/12/15

Very patchy burn, some re-growth



Sprayed 9/12/15

40 litres water. 4 litres concentrate



Inspection 11/12/15

Burn off but not the whole plant has died. Re-growth starting to slowly show



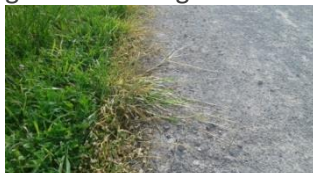
Sprayed 20/1/16

40 litres water. 4 litres concentrate



Inspection 22/1/16

Burn off but not the whole plant has died. Re-growth starting to show



Sprayed 10/2/16

40 litres water. 4 litres concentrate



Sprayed 9/12/15

30 litres water to 300ml Glyphosate + 30ml Versatill for Clover removal



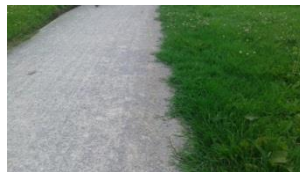
Inspection 10/1/16

Good kill on all weeds but encroachment starting to be seen with current weather and grass growth



Sprayed 20/1/16

30 litres water to 300 ml Glyphosate



Inspection 25/2/16

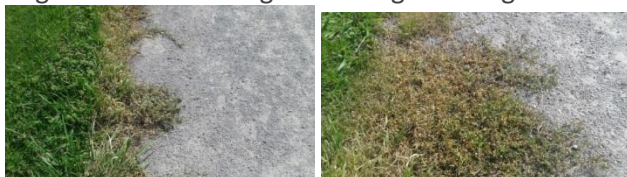
Good kill on all weeds





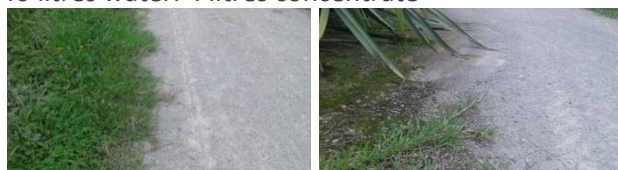
Inspection 12/2/16

Again just burn off with green tinge still apparent.
Edges are encroaching and taking over edge of track



Sprayed 23/2/16

40 litres water. 4 litres concentrate



Inspection 25/2/16

Edge encroachment now very noticeable and
aggregate edge of track has been lost



Total number of sprays for Judea = 9
Total Litres Organic Weed free concentrate used =
29

Total number of Glyphosate sprays for Judea =3
Total Litres of Glyphosate concentrate used =
900mls



PAPAMOA

ORGANIC WEED FREE

Sprayed 9/10/15
11.45am fine 17deg.
1-15 mix = 30 litres water 2 litres concentrate



Inspection 12/10/15
Not much burn off. Needs another application



Sprayed 15/10/15
9 am fine 17 deg.
1-10 mix = 30 litres water. 3 litres concentrate

Inspection 17/10/15



80% burn off.

GLYPHOSATE 360

Sprayed 2/11/15
10am sunny 17 deg.
1-100 mix = 20 litres water. 200ml concentrate





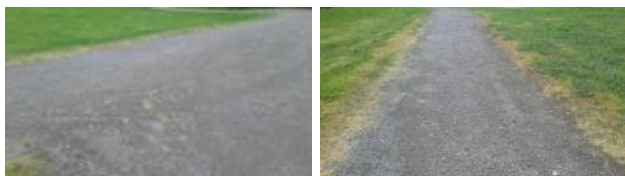
Sprayed 2/11/15

9.15 am sunny 17deg.

1-10 mix =30 litres water. 3 litres concentrate



Inspection 5/11/15



80% burn off. Some new growth showing.

Inspection 16/11/15

All weeds dying except clover



Sprayed 16/11/15

30 litres water. 3 litres concentrate



Inspection 23/11/15

Good initial burn but green tinge still there



Sprayed 30/11/15

30 litres water. 3 litres concentrate



Inspection 12/12/15

Nearly ready for re-spray after 6 weeks





Inspection 2/12/15

Good initial burn but signs of re-growth



Sprayed 9/12/15

30 litres water. 3 litres concentrate



Inspection 11/12/15

Burn off again but lots of green tinge under lying the plant



Sprayed 20/1/16

30 litres water. 3 litres concentrate



Inspection 22/1/15

A good burn off seen but once again not the whole plant has died. Encroachment now on the edges of track



Sprayed 18/12/15

20 litres water. 200ml Glyphosate and 20ml Versatill



Inspection 3/1/16

Good kill on all weeds including Clover



Sprayed 20/1/16

20 litres water. 200ml Glyphosate

No photos for this

Sprayed 23/2/16

20 litres water. 200ml Glyphosate



Inspection 6/3/16

Good kill on encroaching weeds





Sprayed 10/2/16

30 litres water. 3 litres concentrate



Inspection 12/2/16

Partial burn only, a lot of encroachment into track surface now being seen

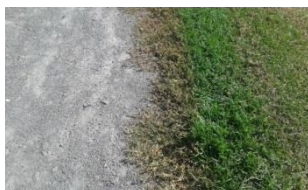


Sprayed 23/2/16



Inspection 25/2/16

Partial burn only, kikuyu runners are spreading 2 foot into track



Total number of sprays for Topaz = 9

Total Litres Organic Weed free concentrate used = 23 litres

Total number of sprays for Topaz = 4

Total Litres Glyphosate concentrate used = 800ml

Total concentrates used up to 23/2/16:

- 52 Litres Organic Weed free
- 1.7 Litres Glyphosate 360



4. Costs

\$30 per litre of Organic weed free x 52 Litres used for trial = \$1,560 + gst

\$5 per litre of Glyphosate x 1.7 Litres used for trial = \$8.50 + gst

The following costs are guesstimated to include the whole tracks and walkways contract network

The full area of track network to spray was based on 65,000 lineal metres (65 kilometres)
Following figures are based off needing 2.9 L organic weed free to spray one km of track. Glyphosate is 240ml per km of track sprayed

Based on cost of Organic weed free product per Litre, to apply to 65km of track network it would cost \$5,655 + gst per application for 188.5 Litres required.

Glyphosate in comparison would cost \$97.50 + gst for 15.6 Litres of product to spray the whole track network once.

If we were to work off 12 applications of Organic weed free (guesstimate) being required over a year to meet track specifications it would cost \$39,585 + gst for the product compared to 5 applications of Glyphosate being required over a year (guesstimate) costing \$487.50 + gst. This would be an extra \$39,097.50 + gst to spend on product annually.

Cost to apply Organic weed free (not including product cost) would be based off the Judea and Topaz trial areas costing \$150.00 per application to do which includes all labour and vehicle costs. This area was 1 km of track so to do 65 km to cover the whole network would cost \$9,750 + gst.

With 8 extra applications required compared to Glyphosate annually this would mean an extra \$78,000 + gst would be spent over a year to carry out the extra sprays required to keep the tracks in specification.

\$78,000 for 8 extra spray applications + \$39,585 + gst for Organic weed free product would cost Council an extra \$117,585 + gst per year to use Organic weed free instead of Glyphosate on the tracks network.



5. Conclusion and Recommendation

Organic weed free is a desiccant which means it only burns the foliage it has direct contact with. From start to finish of this trial this is exactly what RS has seen and observed from this product with a burnt look showing up within days after spraying but then also an under lying green tinge in mature plants to show the plant has not died. This is why the label recommendation is to spray twice within a week to try and burn plants enough that they will be burnt to the roots and die. What RS found was that despite the two applications in a week we still only had about an 80% kill with mature plants tending to slowly recover. Summer grasses like kikuyu also had more chance of surviving due to their strong root zones and as we went further through the summer this became more evident particularly at Topaz reserve.

Comparing this with Glyphosate, RS had a pretty much total kill after only one application with weed control being seen for 5 to 6 weeks plus through this period. The only weeds not being completely removed were Clover and Creeping Mallow. Versatill was applied once during this period to remove the Clover, the Creeping Mallow was only checked by the Glyphosate so was hand weeded as and where needed.

With the weather and in particular the temperature being quite a big factor in the Organic weed free products performance it was interesting that even through January and February RS didn't get a total kill with it despite hot temperatures. This made us think that the product more than likely would have no effect at all through the winter with cooler temperatures.

The other problem RS could see was that it was already hard enough for the team to get around the 65 km of track network spraying in a timely manner (normally takes 3 to 4 weeks depending on wind and rain during that time), but to then have to do a second application within a week of the first application with the Organic weed free product would create a real problem in trying to keep the tracks in specification. This would be particularly hard during Spring and Autumn when weed and grass growth was so active.

Based on our findings we would recommend not using Organic weed free as a replacement to Glyphosate unless extra funding of around \$117,585 + gst was made available to purchase and apply the product, and that there was a change in specification so that weeds in tracks were more acceptable. This would have to include an understanding that some hardy weeds and mature plants may not be able to be controlled at all which could create a problem in the future if they were to spread through the tracks network. Edging and hand weeding would become quite a large requirement which would be a further cost.

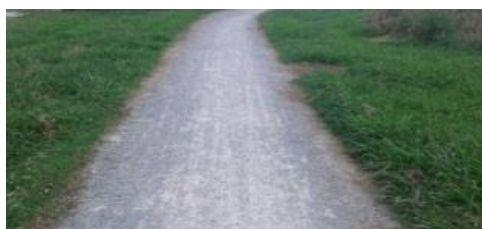
Enquires also need to be made regarding the active ingredients for this product as the supplier told RS they were not going to continue to sell the Organic weed free with Pine Oil going forward, it would just be made up of Fatty acid. No reason was given or known when asked but there has been some talk around the extraction of Pine oil for products like this not being very environmentally friendly.



Completion photos and work to bring tracks back to specification Topaz reserve:



The above photos show the work carried out at Topaz Reserve to bring the track back to specification through March. This is predominantly Kikuyu grass growth around the track that has caused the problem. With its ability through the Summer to grow sideways and encroach into areas it has won the battle over the Organic weed free applications and encroached over the aggregate edge by 600mm each side in some spots. A Glyphosphate application followed up with mechanical edging and hand mowing once the grass and weed cover was killed was carried out.



In contrast, the above photo is the most recent photo of the Glyphosate controlled track at Topaz reserve which is showing little encroachment and no weeds on the track.