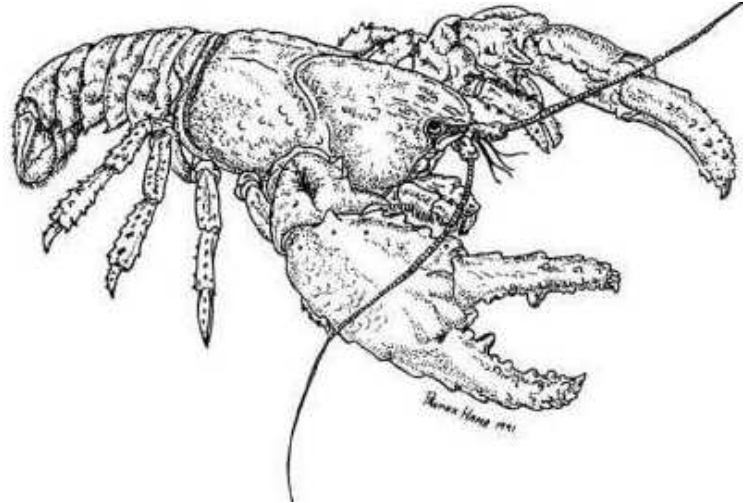


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Herbicides for roadside management - how far should we go

by **Herbert Staubmann**



Fig. 1 Road verge and table drain sprayed twice to clear vegetation. Storm water runoff can flush pollutants from road surface directly via drains into our creeks without first filtering through a grassy filter strip.

(a draft discussion paper for natural resource managers and others)

The following is meant to raise an issue with people who *work in* or are *interested in* natural resource management i.e. works managers/supervisors, environmental officers/engineers, NRM officers, weeds officers, farmers, people interested in water quality, road users (for recreation or otherwise), tourism operators and tourists – anybody who is interested ...

Our road managers have decided to use herbicides to 'control' (kill) a wide strip of vegetation along most of our roadsides.

They are not targeting specific weeds or difficult to slash areas but have adopted the practice of 'clearing', with herbicides, a 1-2 metre wide strip of vegetation from the sealed edge. Regardless of what plants are growing there, whether there is a drainage obstruction or a visibility / safety issue. This practice has been added to the long standing practice of mechanical shoulder grading and slashing to maintain our roadsides.

As a horticulturist/ contractor working in the vegetation rehabilitation industry (including roadside vegetation) for the last 25 years, I have noticed and question this practice.

I have briefly questioned a Municipal Council about the practice - their reply suggests a narrow focus (see page 7). They are not alone, as this practice has become commonplace in the last 6-12 months. Basically, it is probably done this way because it is easy, cheap and convenient. I also think it hasn't been thought through sufficiently.

Trying to take a holistic look, here are **7 reasons not to do it:**

1. Pollution from road surface:

A strip of healthy grass along the road-verge and dense vegetation in the adjoining table drains act together to trap pollutants that are washed off the road before they reach the drains and flow into our creeks, rivers, estuaries and finally the ocean.

This long strip of vegetation acts like an artificial wetland. Particles of plastic, oil, grease, rubber, heavy metals, and dust are washed off the road surface – get trapped in this vegetation filter (where biological break-down occurs) before polluting our watercourses.

The US [Environmental Protection Authority](#) for example, specifically recommends keeping healthy vegetation along roadsides for treatment of stormwater runoff from the road infrastructure.

2. Erosion from road-verges:

A healthy strip of grass binds soil particles on the road embankments, preventing the erosion of gravel and soil during heavy rain events. Once eroded and in suspension these fine particles move with water through table drains – creeks – rivers and finally end up in the Tamar Estuary. Very expensive (federally funded) dredging work is then required to deal with this 'silt problem' in the estuary. Silt and pollutants are either removed or flushed further down the estuary. Between source (the road sides) and final destination these fine suspended particles greatly reduce the water quality of our creeks and rivers.

3. Pollution from chemicals used:

Q. What's used to kill our green grass?

A. Glyphosate and Brush-Off® (according to one Municipal Council).

According to the National Pesticide Information Centre's Fact Sheet [Glyphosate](#) has relatively low toxicity and once in the environment has a half-life in soil of 2 to 197 days and in water the median half-life varies between a few days and 91 days.

Brush-Off® herbicide contains 600g/kg Metsulfuron Methyl. The herbicide label, under Protection of Wildlife, Fish, Crustacea and Environment states: DO NOT contaminate streams, river or waterways with the chemical or used containers.

The roadside drains are the fine arteries of our drainage systems. The runoff is directed into our natural streams.

Q. How much chemical is used?

A. To get a figure we would have to ask each council and the State Gov. how many km of road they are spraying and at what rate the herbicides are applied.

One Council advised that they sprayed approx. 350 km of road in April 2015.

A 'back of the envelope' calculation: 350 km x 1.5 m wide strip x 2 (both sides of the road) = 105 ha sprayed with herbicide. At the Label recommended rate of 10g/ha Brush Off® (600g/kg Metsulfuron Methyl)

and 4.8 l/ha glyphosate (450g/l glyphosate) that would be 1kg of Brush Off® and 500 litres of glyphosate used in one application of roadside spraying by that Council. Add to that the chemicals used on state roads in the municipality.

According to the Australian Government [Department of Infrastructure and Regional Development](#) website Tasmania's council managed local (sealed) road network is 6,937 km.

Tasmania's [state government managed \(sealed?\) road network](#) is 3,650 km.

It would appear that most of the roads in the north, north east and northwest have been sprayed. If this is done over the whole state, a 'back of the envelope' calculation suggests: 3,000 ha sprayed, resulting in about 30 kg of Brush Off® and 14,400 litres of glyphosate used in one application of roadside spraying over the whole state.

Note: Application rates for control of woody and perennial weeds in non-agricultural areas range from 1.2 to 7.2 litres/ha and 10 to 80 g/ha for glyphosate 450 and Brush-Off® respectively. So the 'back of the envelope' calculations used above are estimates. The actual rate used would have to be provided by council and state contractors (record keeping of spray applications is mandatory under the *Agricultural and Veterinary Chemicals (Control of Use) Act 1995*)

4. **Weed incursion:**

Using herbicides to control vegetation without replacing it with some other vegetation or non-vegetation cover (e.g. another crop, mulch, concrete...) does not work unless you keep repeating it at infinitum. That is, short life-cycle plants/weeds will colonise the bare ground created by killing off grass. This can already be observed after the first spray round. To keep the ground clear of any vegetation may take 4 (or 5) repeat sprays per year.

Referring to point 3 briefly, the 'back of the envelope' calculation with 4 repeat sprays: = 120kg of Brush-Off and 56 600 litres of glyphosate (concentrate) to keep our gravel shoulders clear of greenery.

This is an estimate, as actual application is unknown. However even half that amount is a lot of additional herbicides applied right into our storm water drainage system.

5. **Risk of Herbicide resistant weed development:**

This point may be technical but anyone with a basic grasp of 'natural selection' can understand it.

Basically, the repeated use of the same herbicide(s) increases the risk of the development of herbicide resistant weeds over time. Along the 'edge' or 'boundary' of a sprayed area some plants will receive a sub-lethal dose of herbicide (a few drops on a leaf only – not sufficient to kill the plant). Those individuals that are best able to survive these low doses can reproduce, pass on their genes ... This has already happened in cropping situations in Australia and other countries.

The problem is already big enough for manufactures of both glyphosate and metsulfuron methyl based herbicides to give a **Resistant Weeds Warning** on the label.

For example, the label on Wipe-Out® (a common glyphosate containing herbicide) states:

For weed resistance management Wipe-Out 450 is a group M herbicide. Some naturally occurring weed biotypes resistant to Wipe-Out 450 and other Group M herbicides may exist through normal genetic variability in any weed population. The resistant individual can eventually dominate the weed population if these herbicides are used repeatedly

Of course the statement goes on to insist that the manufacturer '... Adama Australia Pty Ltd accept no liability for any losses ...'

The warning on the Brush Off® label is almost word for word, except that it 'is an ALS inhibitor (Group B herbicide)', the label goes on to say 'some populations of annual Ryegrass and a few broadleaf weeds are already known to be resistant to Brush-Off®... since the occurrence of resistant weeds is difficult to detect prior to use, Du Pont (Australia) Ltd. accepts no liability ...' the label goes on suggesting to use herbicides with different modes of action to minimise the risk of resistant weeds occurring and that '... Large numbers of healthy surviving weeds can be an indication that resistance is developing. Efforts should be taken to prevent seed set of these survivors. DO NOT make more than one application of ALS inhibitor herbicide to a pasture in any one year. If the user suspects that an ALS inhibitor resistant weed is present, Brush-Off or other ALS inhibitor herbicides should not be used ...

Further to that, the Australian Glyphosate Sustainability Working Group was established in 2004 to deal with glyphosate resistance issues [Item 1](#) and [Item 2](#)

The point is that these herbicides are important tools for agricultural production and overuse can compromise the availability of these for the future. Note that manufacturers deny any liability.

6. **Remnant native vegetation and threatened species on roadsides**

Some of our roadsides are refuges for native vegetation (including rare or threatened species). Over the last 25 years significant tax funds have produced maps and reports and management plans/systems to manage this valued vegetation better. Councils were consulted, contractors and managers attended field days. In many cases timed slashing programs are actually beneficial for some species and communities ... Some of this is available in [book form](#) and on the [web](#)

7. **Not a good look:**

Green plants on our roadsides actually enhance Tasmania's 'Clean Green Image'. A healthy strip of green grass is appealing to the eye, one reason why most of us, at least instinctively, like lawns and green fields. It visually softens the road corridor.

Watch a bit of the 'Tour de France' to see how the French manage their 'Clean Green' image without making a big fuss. They are not the only ones.

One Municipal Council has provided **4 reasons why they have to spray:**

1. Keep guideposts and bridge approaches visible.
2. Maintain a gravel shoulder for safety reasons.
3. Improve water flow (drainage) from the road surface to the table drains and
4. To complement their annual capital reseal program, i.e. maintaining gravel shoulders until resealing occurs.

Other reasons could include fire break maintenance and wildlife visibility.

However, none of the stated reasons indicates any concern for the natural environment. They are totally engineering and economic concerns.

General replies could be:

1. Guide posts and bridge approaches can be kept visible by slashing or other methods such as [steam weeding](#)
2. Gravel shoulders can be safe when firm and unsafe/slippery when loose or soft. Spraying is not restricted to strip of gravel next to the seal but extends in many cases from the seal down the embankment/shoulder and across the table drain. An indiscriminate strip is sprayed, it appears, from one end of the state to the other.
3. Water flow from the road to the table drains can be achieved by having a gently sloping shoulder, level with the road seal, to allow the water to get off the road. From there it should flow through a dense thatch of grass between shoulder and table drain and then through a well vegetated drain into our creeks...
4. A strip of gravel next to the sealed edge is a normal 'shoulder' (say 500mm wide). There is no logical reason to spray the embankment of the shoulder and the table drains in terms of complementing a reseal program.

Council and State road managers may have other reasons why they have adopted this herbicide practice. As mentioned above, it is assumed that it is done because it is cheap, easy and convenient. There are many reasons why the practice should be discontinued. None of the arguments against the practice are described in a fully comprehensive way, but are sufficient to raise the issues for deliberation and discussion. Short term economic cost is probably the principle justification but this does not consider the longer term implications, environmental implications, or aesthetic implications - these all must be taken into account by a professional road manager. Rethinking should result in changing current practices before more serious damage to our road verges occurs.



Fig. 2 Vegetation killed on steep embankments around culvert intakes leads to erosion of soil and gravel – pollution of watercourses by suspended particles – siltation of our estuaries.



Fig. 3 Herbicide applied once, from the sealed edge right across the table drain. Short lifecycle weeds are starting to dominate on the gravel shoulder. More frequent spraying is required to keep weeds from seeding into the bare area as well as into neighbouring properties.



Fig. 4 An example where Markers signifying important native vegetation / threatened species were ignored by spraying contractors.



Fig. 5 Not a Tasmanian roadside. That's how the French do it. Green grass all the way to the edge of the sealed road.



Fig. 6 Why? Attractive? Save on mowing costs? Unless resprayed several times each year this bare strip will be occupied by short life cycle weeds.



Fig. 7 A Tasmanian road corridor

Table drains cleaned with excavator and sprayed twice to prevent any vegetation to regrow. This will need to be done more often as there is already a tinge of green appearing again. Erosion is

evident, silting up the drain-line.

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