

ANNUAL REPORT ON COUNCIL'S USE OF TOXIC AGRICHEMICALS FOR VEGETATION MANAGEMENT POLICY (DC9)

An overview of activity by the Toxic Agrichemical advisory Forum for the year July 2019 – June 2020.

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Recommendations

- TCC staff make adjustments to the database that captures spray-events, in order to reduce the potential for data errors
- Amend the conditions of use for metsulfuron in schedule 1
- signage/ app discussions be prioritised, to enable reserve users to access dynamic information on when reserves were last sprayed and reference information on which reserves are glyphosate-free
- TCC submit a research voucher request to Toi Ohomai Institute of Technology to undertake territorial authority discovery project
- the vegetation management policy be reviewed in 2021

Agrichemical use in 2019

Access to monthly data on agrichemical use ceased mid-2019, TAAF have requested this resource continue to be shared but we understand there have been staffing challenges with new TCC employees who are not yet familiar with the location of this resource and how to share it. TAAF are hoping the pivot tables will be made available in the near future; being able to regularly monitor agrichemical application events allows us to see whether application events comply with policy, and to notice any trends in use.

A couple of small errors in the pivot table were resolved (agrchemicals on the drop-down list that were not approved for use). A design correction has been made to remove agrichemicals from that drop-down list, but other design improvements have not yet been addressed.

TAAF requested that roading and engineering staff representatives attend a TAAF meeting and outline what agrichemicals are required for their work. Not yet achieved.

Agrichemical use over ten years – research findings

A research project undertaken at Toi Ohomai Institute of Technology in 2019 evaluated the volumes of agrichemical used by TCC contractors over ten years (See Appendix 1 for full report).

While a slight decline in application volumes was found across the ten-year period, there was no statistically significant reduction. The extent of data errors doesn't allow for a high level of confidence in findings. Double handling of data by contractors presents a significant prospect of data entry errors in the TCC spray activity database. Potential for improvement identified here.

Further complicating the findings, TAAF did not have access to annual property data for Council-maintained land, so cannot comment on whether any annual fluctuation in application volumes was influenced by increases or decreases in the area of Council-maintained land over the ten years.

There were some significant errors in data identified by the researchers, the potential for those errors to occur ongoing can be resolved with some improvement in database design. TAAF suggested relational links between fields which would prevent a number of recurring data errors and further education of contractors regarding database best practice, this work relies on TCC staff to action.

There is a possibility for a Summer Scholarship student at Toi Ohomai Institute of Technology to undertake design improvement of the database, work required to progress this from TCC staff, TAAF and Toi Ohomai.

Amendments to Schedule 1, 2020

By agreement between TCC and TAAF, when applications for the addition of new agrichemicals to schedule 1 are received by TCC, they are shared with TAAF straight away. This enables TAAF volunteers to plan for the research required and provide a timely report.

No applications were received in the 2019-20 year (closing date for applications is 1 May each year) and therefore no new agrichemicals have been reviewed for schedule 1. At time of writing, a request to amend conditions on metsulfuron has been circulated to TAAF. Due to the impacts of Covid-19 on many workstreams, TAAF were happy to receive and review this request to amend the schedule. The proposed amendment to schedule 1 has been considered and TAAF supports the recommendation from the contractor to extend the list of target species and remove the time limit on use for bushy asparagus.

We understand TCC staff are in the process of contacting all contractors to ask whether there are any agrichemicals on schedule 1 that they do not use/require. Analysing ten years' of agrichemical use highlighted a small number of agrichemicals on schedule 1 that have not been used in recent times, indicating they may be redundant and could be removed from the schedule.

Signage & public information

A map showing glyphosate-free reserves can now be viewed on the TCC website. It is in PDF so it's not dynamic; users can't zoom in on location detail or access any other information from

within the map. TAAF has subsequently been exploring how TCC might be able to publicise the status of those reserves. Signage at the reserves is a priority.

Discussions continue regarding permanent labelling on reserve signs to inform users whether the reserve is sprayed, or designated glyphosate-free or spray-free ongoing. TAAF has proposed QR-code stickers (approx. 6x6cm) retro-fitted to existing signs as a simple way to provide access to information at low cost. A unique QR code on each reserve sign can link users directly to a reserve profile on TCC website, which already exists. At this time, TCC staff have not engaged in progressing this or any alternative solution, but discussion is ongoing.

A separate issue is enabling reserve users to find out whether the reserve they are visiting has recently been sprayed or whether contractors are on site at a particular time. Information on spray events is all available on TCC's website, but many reserve users do not know of the website and the information may not currently be easily searched by users. Further investigation required as to options for supporting users to access dynamic information according to location.

Signage in the vicinity of spray events generally, has been on the agenda for some time. Contractor signs used comply with Regional Council requirements in principle, but in practice reserve users may not always be able to read or understand the information recorded on those signs. TAAF recommends that a standard sign is developed and used by all contractors and provision of further education for contractors regarding the public value for clear signage. TAAF has been exploring signage that TCC might consider adopting.

Since these discussions were first tabled there have been advances in the adoption of apps and other dynamic online tools for users by TCC, and it may now be possible to add a layer of information about agrichemical spraying events to an existing tool. More work to do here.

TAAF has arranged a communication opportunity with Envirohub, who welcome content for their monthly newsletter related to environmental matters. We anticipate TAAF news will start appearing in this newsletter, which has wide reach across the city.

Oxadiazon trials – Blake Park, Oceandown Reserve

Blake Park turf development was delayed, and as a result Oceandown development was pushed out to the following summer. TAAF were satisfied that the change in timing was justified, and were satisfied with the soil microbial findings, which indicated fluctuations within normal parameters as a result of oxadiazon application. Peaks in bacterial activity may warrant further investigation, to understand whether the bacteria pose any risk to human health, and perhaps to determine best practice in regard to soil disturbance during that time.

Test results from Hills Lab indicated traces of pendimethalin (not approved for use) and DDE/DDT (Pasture-Kleen, not for use in active reserves) at Blake Park. Speculated by the turf specialist to derive from historic application, which must pre-date the vegetation management

policy and therefore interesting to see residue for product sprayed more than 12 years ago. Relevant to note that in these same soil tests there was almost no trace of oxadiazon within three weeks of application, suggesting that its use offers little to no benefit in turf development on sandy soils (at the same time, the treatment area experienced invasion by unwanted weed species that were intended to be suppressed by the oxadiazon, and this resulted in non-budgeted post-planting management using alternative methods).

The rate of application at Oceandown was increased from 300kg/ha to 400kg/ha, which the turf consultant reports is at the top end of the application concentration and a decision made due to the lack of protection from emergent weeds in the Blake Park trial. Despite this, at all times during the 5-month trial, post-treatment residue was 28% lower than expected; this raises questions about the rationale for relying on a product intended to have residual effect. The consultant's report indicates treatment at a higher application rate did not prevent weed infestation. Conclusions from the turf consultant also found 20-25m of lateral movement of the product into the control area over three months, suggesting that designated safe public access areas outside of fenced treatment areas are subject to contamination. While the project report observed that the lateral movement of product was unlikely to have any significant impact on plant germination, TAAF prioritises further investigation of the potential impact on users who, in good faith, continue to access designated 'safe' areas in the vicinity of treatment areas.

There is insufficient data arising from the trials to support the consultant's finding that the residual presence of oxadiazon found in soil does not pose a health risk to park users. This study was not exploring the health impacts of oxadiazon and there are no longitudinal studies of sub-lethal exposure to inform that conclusion.

There is insufficient data arising from the trials to support the consultant's finding that leaching from surface soils to groundwater is 'low or negligible'; only a single soil sample was analysed from below 500mm and no testing of groundwater was undertaken.

Trial results suggest no further justification for oxadiazon use and flags the need to look at future development areas to ensure the perimeters are large enough to encompass the laterally affected zones outside of the treatment area.

Research

Toi Ohomai institute of Technology is undertaking a citizen science research project in collaboration with TAAF and several local schools, with endorsement from the Royal Society and TCC staff. Field work will take place in schools during October – November 2020 exploring the efficacy of acetic acid for weed control. There has been a lot of community interest in the project and some teachers have asked about the possibility of student voices sharing the research findings with Council at the point the findings are ready to publish.

Another research project is in development, with the intention to explore policy and procedure at other territorial authorities around NZ in regard to agrichemical use. Particular themes to

explore include whether other councils have a vegetation management policy similar to TCC, whether there are any local restrictions on agrichemical use, whether there are other advisory groups like TAAF, whether councils notice any community concerns about agrichemical use in reserves and how they respond. TAAF are in discussion with TCC staff about submitting a request to Toi Ohomai Institute of Technology for the delivery of this applied research, which would include financial support from Toi Ohomai to do that work.

Conclusion

TAAF commitment to supporting the implementation of the Vegetation Management Policy continues. We have a broad skill-set in the group but remain small in numbers and would like to see new members coming onboard in the next 12 months in order to share the burden of work which, at times, can represent a time challenge for volunteer members.

Discussion regarding a review of the Vegetation Management Policy has been on the agenda for several months, and TAAF supports a review in 2021 given the policy was introduced over ten years ago.

TAAF are committed to forming and re-establishing relationships with TCC staff, in order to update and extend our understanding of TCC vegetation management needs and to generate opportunities for sharing perspectives and discussing innovations in product and method choices for weed control.

Appendix 1

Agrichemical use on Tauranga City Council- maintained land

Final Report

Lisa Denmead & Catherine de Monchy

December 2019

1.0 Background

2.0 Methodology

The project analysed secondary data in an Excel spreadsheet supplied by Tauranga City Council. Analysis looked at totals and trends in agrichemical use over a ten year period (where available). Findings were summarised graphically, showing overall total annual usage of agrichemicals, as well as total annual use for consistently highly used agrichemicals for the duration. Overall trends were indicated using linear regression lines on the graphs and R values for each regression line. R values indicate the strength of the relationship between agrichemical use and time, ranging from -1 (negative relationship) to +1 (positive relationship). The closer the R value is to +1 or -1, the stronger the relationship, and closer to 0 means a weaker relationship. Data summaries informed a critique of trends, limitations and the implications of findings to inform a review of the policy.

The primary research questions:

- Is there evidence of a reduction in use of any high use agrichemicals (vol)?
- Is there evidence of an overall reduction (vol) in agrichemical application?

3.0 Results

3.1 Changes in agrichemical use 2009-2018

When considering all agrichemical use from 2010-2018 (2009 is excluded from analysis due to only having 11 months of data) there is a negligible negative relationship ($R = -0.30$) between total use and time (Figure 1a). However, there are some large outliers in the data, in 2014 and 2015 in particular, due to large revegetation projects. Reanalysis excluding application for revegetation showed a stronger ($R = -0.69$) decline in use (Figure 1b).

The two agrichemicals used most by volume from 2009-2018 were glyphosate (Roundup) and picloram/triclopyr formulation (PTF) (sometimes referred to in the data as Tordon) with 22723 L and 5306 L respectively. Total PTF use has declined from 2010-2018 (Figure 2a, $R = -0.58$), however, glyphosate use only shows a negative trend over time when excluding applications for revegetation (Figure 2b, $R = -0.67$)

Following glyphosate and PTF, the next highest use agrichemicals have been pulse penetrant (2339 L) and codacide oil (2056 L). However, these are both used in conjunction with other agrichemicals to reduce spray drift and therefore their use alone has not been analysed.

Finally, Galant (915 L), Versatil (864 L) and Grazon (761 L) were also consistently high use agrichemicals over the 10 year period. Versatil and Grazon have both been increasing in use, however, Galant shows a very slight decline in use (Figure 3).

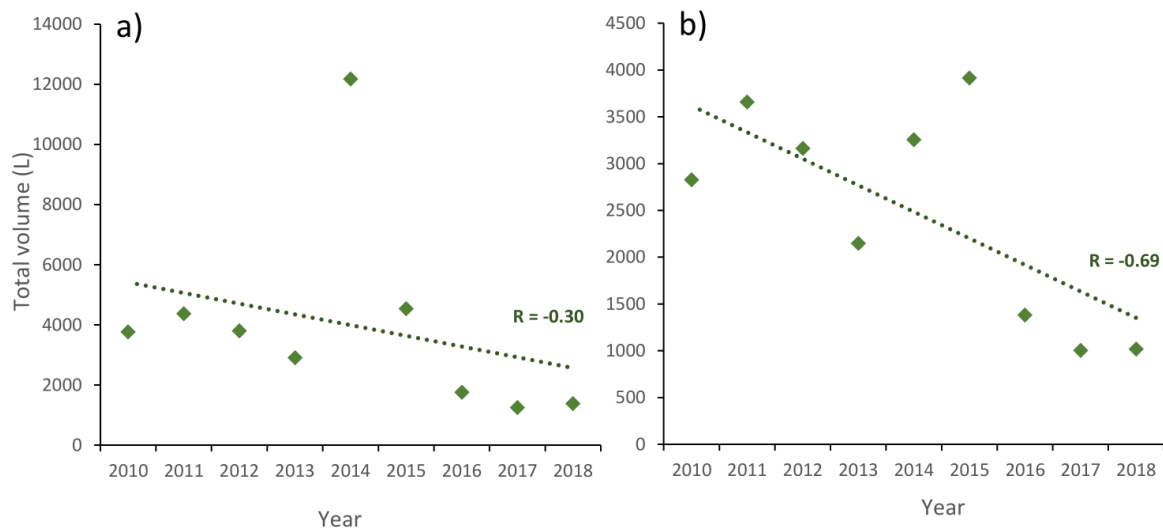


Figure 1. Total volume of a) all agrichemicals used each year 2010-2018 and b) all excluding use for revegetation. 2009 excluded because only 11 months of data.

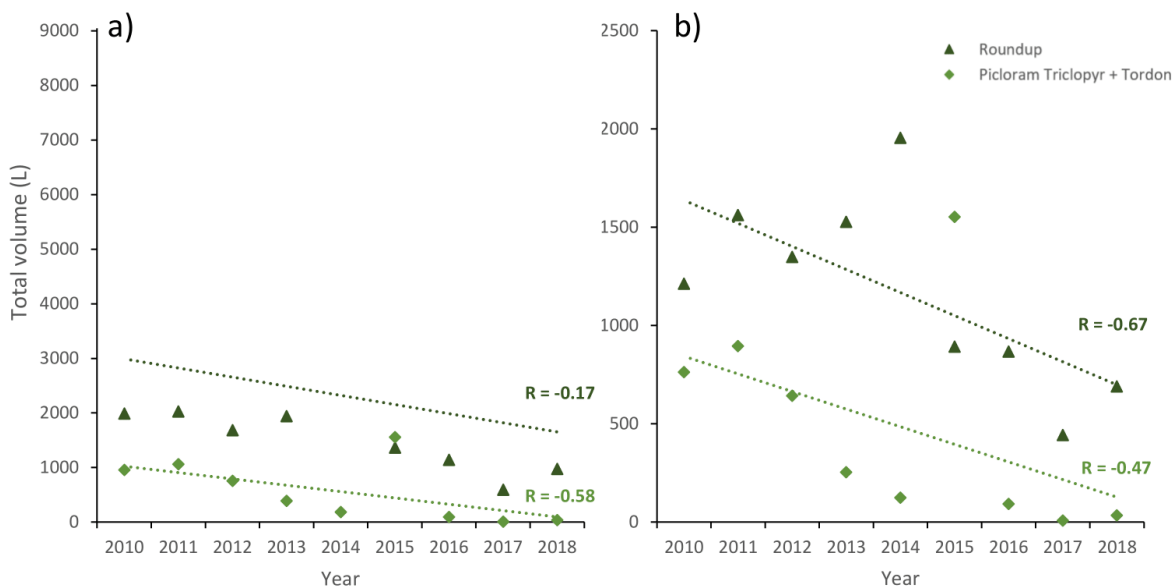


Figure 2. Total volume of two highest use (by volume) agrichemicals each year 2010-2018, a) all applications and b) all excluding use for revegetation. 2009 excluded because only 11 months of data.

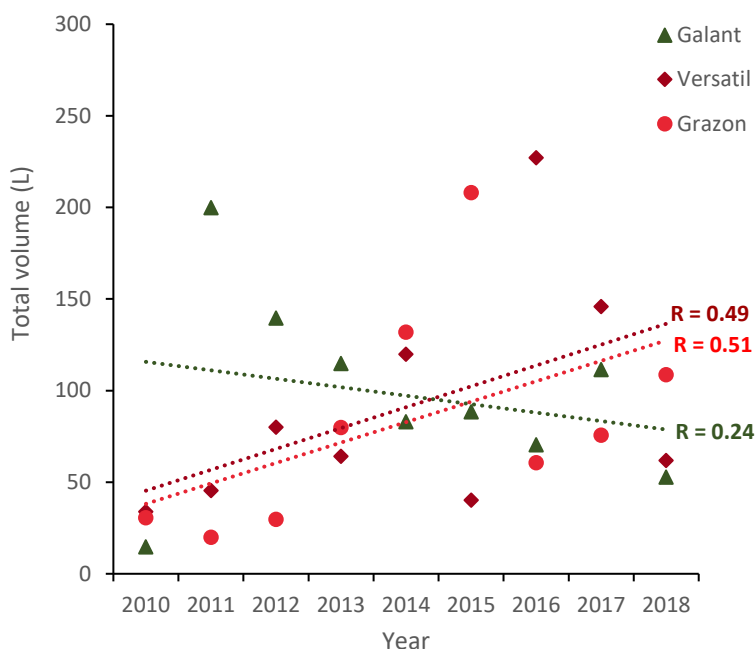


Figure 3. Total volume Galant, Versatil and Grazon used each year 2010-2018. 2009 excluded because only 11 months of data. Colour green indicates decreasing use, red indicates increasing use.

3.2 Problems with collected data

3.2.1 Reason for use

When contractors input data on agrichemical use they must choose a “reason” for use from a drop-down menu. The reason is a combination of the type of agrichemical and the type of work or location sprayed (Table 1). We found 201 instances in the data collected where the contractor had chosen a reason that did not coincide with the correct type of agrichemical. For example, a contractor may have chosen “herbicide - revegetation”, for an agrichemical that is an insecticide. Five agrichemicals used are also not herbicides, insecticides or fungicides yet those are the only options available to the contractor so have been allocated as one for each application because these are the only choices; they are wetting agents, plant growth regulators or are used to reduce spray drift.

There were many more instances in the data where the contractor has chosen a reason where the second part does not coincide with the notes included in Schedule 1, for example Conquest notes are “for use on turf to kill onehunga weed” yet the reason chosen is most often not Herbicide – Turf.

Table 1. Options in drop-down menu for contractors to choose as reason for agrichemical use.

Reason
Herbicide – Revegetation
Herbicide – Garden (incl. Shrubberies)
Herbicide – Around trees
Herbicide – Waterways
Herbicide – Walkways
Herbicide – Noxious Weeds
Herbicide – Hard surface

Herbicide – Turf
 Herbicide – Other (please specify)
 Insecticide – Garden (incl. Shrubberies)
 Insecticide – Turf
 Insecticide – Other (please specify)
 Fungicide – Garden
 Fungicide – Other (please specify)
 Sportsfield Line Marking

3.2.2 Location

The data included in the “location” column is not consistent or specific in a large proportion of the data, which makes it more difficult to track and analyse agrichemical use at different locations.

Many locations are not written in a consistent way, and although they may only be small differences this makes it very difficult for analysis. For example “K Valley-Puketoromiro Pa” then three days later it is written as “K Valley-Puketoromiro Pa Site” or “Castlewold Drain” then the next day “Castle wold Drain” or even just writing “res” rather than “reserve”.

Many of the agrichemical records also have multiple locations listed in the location column. For example, “Annandale, Cheyne Park, Marine park, Blake park”, these locations are all over the city, and subsequently the record has “unknown” in the region column, another common issue throughout the data.

Finally, there is other information included in the location column, for example, text such as “Spraying at the lakes weather permitting” was used a number of times.

3.3 Use of agrichemicals not included in Schedule 1

On three occasions agrichemicals were used that are not included in schedule 1 (Table 2). Mancozeb has also been used during the 10-year period and it is not on schedule 1 currently, however, it was included for a trial previously.

Table 2. Records of agrichemicals used that are not in schedule 1.

Date	Contractor	Agrichemical	Vol (L)	Reason
27/02/2009	GardenScene	Suscon Green	1.0	Herbicide - Noxious Weeds
31/03/2014	City Care	Restore	1.4	Herbicide - Revegetation
26/11/2013	BOP Cricket Association	Break-Thru Gold	1.2	Herbicide - Turf

3.4 Agrichemicals included in schedule 1 which have had limited or no use

Neem and Organic Interceptor were not used during the 10 year period. Three other agrichemicals were only used once, and/or the volume was 1L or less; Yield (two applications, total use = 1 L), Pyrethrum (one application, 0.4 L), Amistar fungicide (one application, 2.5 L). AGPRO BIO-safe was used quite frequently prior to 2014, but has only been used once since (0.3 L). Similarly, Moddus has only been used once (0.1 L) since 2014, and Pasture Kleen has not been used since 2012.

4.0 Discussion

Overall there has been negligible reduction in the volume of agrichemicals being applied on TCC managed land during 2009 - 2018. Excluding known revegetation projects from the data however, indicates a decline in reliance on agrichemicals for maintenance purposes over ten years. This declining trend was likely strengthened by 2016 – 2018 data, during which time, 20 reserves within Tauranga were designated glyphosate-free status. To best evaluate the agrichemical use against policy objectives it would be important to also analyse application volumes relative to TCC-managed land area, however at this time we have not been able to access TCC's complete land asset data. Without that, and the high variation year on year, we can only conclude that overall, there has not been a reduction in agrichemical use on council-maintained land.

Limitations in the database design prevent analysis of agrichemical application volumes by location. Furthermore, incorrect data input regarding reason for use prevents monitoring of contractor's practices. Errors in data collection impact on all results and undermine summary analysis of agrichemical application trends.

Non-compliance with schedule 1 appears to be very limited. Prior to 2019 the database did contain a small number of named agrichemicals that were not approved for use, a problem that has now been resolved. The database should only contain agrichemicals that are currently approved for use. It highlights the need for the database to be checked and adjusted each year after any changes to schedule 1 have been approved by Council. It also raises the prospect that contractors rely on what the database 'allows' to guide them in their application choices, which appears to have been the case where mancozeb was used.

Although organic pesticides do not appear to be widely used (i.e. Neem, Organic interceptor, Pyrethrum and AGPRO BIO-safe), these are preferable options according to policy objectives and therefore should remain on schedule 1. Yield is used infrequently and Amistar was only approved for use in 2018; both are fungicides. Fungal species are susceptible to resistance, therefore retaining access to a range of treatment options is optimal for minimising the time/ product volume required to resolve a fungal flush.

Moddus doesn't appear to be a product suited to the contract work undertaken on Council land and could be removed without any apparent impact. Pasture-Kleen contains 2,4-D, which is a possible carcinogen. There are other broadleaf control options on schedule 1, therefore, Pasture-Kleen could be explored as an agrichemical to remove from schedule 1.

5.0 Recommendations

1. A discussion with the contractors to determine what works and doesn't work for them concerning inputting the data. Further to that, education for the contractors regarding why we have this database and best practice for its use.
2. Following discussions with the contractors and the outcomes of this report, a full review of the database and how the data is input. For example, one key change that would decrease the number of problems in the "reason for use" column (2.1), would be to have two columns; one for "type", including herbicide, fungicide, insecticide, wetting agent, plant growth regulator and reduce spray

drift, and the other “reason”, but the options in the drop-down menu in the “reason” column are conditional on the first selected “type”.

3. Codacide and Pulse penetrant are the mostly highly used agrichemicals after Roundup and Picloram/Triclopyr formulation due to them needing to be used with other agrichemicals to reduce spray drift. Further research is required to understand what codacide and pulse penetrant are being used with and if this needs to be included when data on use is being recorded by the contractors
4. A full schedule 1 review, including: removing low use agrichemicals, updating active ingredients where needed, adding in the type of agrichemical (new column in table) and evaluating the notes for each agrichemicals (more informative notes may be needed).

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