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Sharing responsibility for managing weeds on roadsides

FINAL REPORT

Project team

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ACKNOWLEDGEMENT OF COUNTRY

We acknowledge the Traditional Custodians of Country and their continuing connection to land, sea, waters and community. We pay our respects to the Traditional Custodians of the lands on which we live and work, and their Elders past and present.

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Executive summary

This research is part of the 'Area wide management for cropping systems weeds' project (<https://research.csiro.au/weed-awm/>). Area-wide management (AWM) aims to reduce the impact of weeds through collective actions by land managers across a landscape. Work with growers and other stakeholders earlier in the AWM project identified that roadside weed management by local governments was a major concern that affected the success of area-wide management of weeds (Height et al. 2022).

WHAT IS THE AIM OF THE RESEARCH?

To understand how councils in cropping areas across Australia work together with neighbouring farmers to control roadside weeds.

1. How have councils engaged with farmers to manage weeds at a landscape scale including on roadsides adjoining cropland?
2. What do councils need to conduct, support and facilitate improved roadside weed management and area wide approaches to weed management?
3. How can state government better contribute to better roadside weed management?

WHAT HAS BEEN DONE AND FOUND?

The research team completed 35 interviews with 20 council staff and 15 staff from other organisations with a role in roadside weed management (e.g. regional natural resource management organisations and State government).

Key findings include:

1. I. **There is limited engagement** between councils and farmers with respect to managing roadside weeds in cropping areas. Existing engagement is primarily educational.
II. **A willingness to collaborate** was evident among council staff and participants from other organisations, but current systems for roadside weed management hinder their developing and sustaining collaborations.
2. Councils need:
 - **Support** – from farmers, other landholders and staff within their council;
 - **Resources** – increased and continuous funding to enhance staff capacity; and
 - **Communication** – enhanced communication between stakeholders about roadside weeds, this includes better farmer education as well as clearer communication regarding who is responsible for managing roadside weeds.
3. State governments can provide support through:
 - **Funding** – for weed risk assessments, investment in R&D, and further roadside weed management;
 - **Leadership** – of cross-tenure weed management, especially along roadsides and linear reserves;



- **Institutional support** – through recognition of community priority weeds, supporting guidelines and legislation; and
- **Better communication** – between state government agencies and other organisations involved in managing roadside weeds.

WHAT IS NEEDED NEXT?

The following three suggestions, identified by interviewees and researchers, specify opportunities for how councils in cropping areas across Australia could work together with neighbouring land managers to control roadside weeds:

- Identify best practice case studies of collaborative roadside weed management in cropping areas;
- Increase availability of funding for roadside weed management that can be spent over longer timeframes (3+ years); and
- Develop a nationally accessible, updated information source to enable council staff and contractors to identify weeds and learn about current best management practice for their circumstances.



Background

Roadside weeds are a critical component of landscape-scale (or area-wide) weed management (Harper-Lore et al. 2007) and are consistently raised as a weed management concern by stakeholders in cropping regions. The magnitude of the problem can be seen in a recent survey of major roadsides across the south-west Western Australia cropping region, which identified a total of 144 species of weeds present along roadsides (Borger et al. 2019). Vehicle movement along roads acts as a significant vector for the spread of weeds (Bajwa et al. 2018; Harper-Lore et al. 2007).

Local councils' participation in roadside weed management has been identified as vital to the success of area-wide weed management programs (Height et al. 2022). Yet, there has been limited research undertaken with councils to understand their experiences, needs and capacities in the context of area-wide roadside weed management. The aim of this project is to understand how councils in cropping areas across Australia work together with neighbouring land managers to control roadside weeds with potential to spread into or impact cropping systems, and how state governments support them.

Thirty-five interviews were undertaken with: 20 council staff including biosecurity officers, weeds officers, or staff with roles in works or environmental sustainability; and 15 staff from 'other' organisations with responsibilities for management of weeds on roadsides (including diverse regional and state government organisations).

This document reports on the results of the interviews and is organised around the following three research questions:

1. How have councils engaged with farmers to manage weeds at a landscape scale including on roadsides adjoining cropland?
2. What do councils need to conduct, support and facilitate improved roadside weed management and area wide approaches to weed management?
3. How can state government better contribute to better roadside weed management?

THE COLLABORATION CONTINUUM

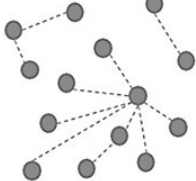
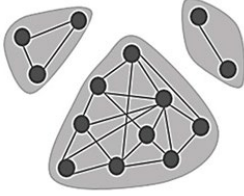
Before diving into the results, there is a key concept—the collaboration continuum—that can be used to help understand the extent to which council staff and farmers work together on roadside weeds.

The collaboration continuum (Table 1) suggests that at a minimum, collaboration involves people working alongside one another, termed 'co-existing'. The next stage, communication, involves people sharing information with one another as the main form of helping one another out. Beyond sharing information, as people begin to develop shared goals, plans and activities, the collaboration becomes more 'coordinated'. Finally, the most 'integrated' form of collaboration not only involves people working together, but also sharing resources and linking up with other collaborations.

Overall, moving from communication to coordination and integrated forms of collaboration involves increasing alignment of work among partners, planning for the



Table 1 Collaboration continuum and features of each type of work (adapted from Graham 2019, p. 254; Weaver 2021). In the diagrams, dots indicate individuals, dotted lines indicate weak relationships, solid lines indicate strong relationships, and thick solid lines indicate linked networks. Grey shaded areas indicate individuals involved in the coordinated, collaborative or integrated work.

Type	Coexisting	Communication	Coordinated	Integrated
Diagram				
Features	Individual work Own land No systematic connection	Often led by one organisation As needed Distinct events	Small scale Local networks	Larger scale Linked networks Longer timeframe
Collaborative activities	Absent	Information sharing	Coordinated work	Social learning Sharing of resources

long term, moving from discrete activities to a more systematic approach, developing shared goals and both decision-making and resources being shared among partners. Fully integrated forms of collaboration unite a long-term structure, shared goals, pooled resources and processes for collective decision-making. All four types of collaboration were evident in the interviews.

How have councils engaged farmers about roadsides?

Council staff described a range of types of engagement with farmers for roadside weed management, which we have grouped under three categories: no engagement and coexisting; communication, both informal and formal; and coordinated.

NO ENGAGEMENT AND CO-EXISTING

Six of 20 councils do not typically engage with farmers on roadside weed management. These six councils are situated across three states: NSW, Queensland and WA. These councils managed weeds on the roadside land for which they were responsible without reaching out to the farmers who manage the adjoining land: “I don't think we need it [engagement with farmers on roadside weed management]. They manage the weeds in their crop. We manage the weeds on the road” (Council).

Some staff explained the lack of engagement is due to insufficient resources and staff time to engage with farmers, being unable to control what landholders do, or that landholders already manage roadside weeds.

[We] basically leave them to do their thing. I can't be everywhere and control everything, so they'll do what they want to do. A lot of them have been here for a very long time and they do what they do. (Council)

Interviewees from five councils described co-existing with farmers. This differs from no engagement because they are aware that farmers are involved in roadside weed management and act in ways that indirectly support or avoid negatively affecting farmers. In co-existing there is still no direct communication with farmers about roadside weed management.

Four Victorian councils co-exist with farmers by relying on community groups or contractors to engage with and support farmers, i.e. they rely on third parties for engagement: “any of the state funding that we get we pass on straight out to the Landcare groups and they are talking to the farmers” (Council).

COMMUNICATION

There were two ways in which council staff reported communicating with farmers about roadside weeds: informal (largely in groups) and formal (largely with individuals).

INFORMAL

Informal communication occurs outside of the obligations of councils or other official processes. This type of communication was reported by seven councils and was used in different ways. The most commonly referred to was education, where council staff communicate with multiple farms at local shows or via social media. These ‘informal’ channels of communication could also then lead to more formal types.

We also provide education and awareness field days. So, we attend [several] local shows across our region on a yearly basis, and we have a display site there with a trailer and quite a few displays with specific weeds... We spend a lot of time at those shows and provide fact sheets and information on restricted matter. (Council)

In two cases, the communication had an underlying message that farmers and councils both contribute to roadside weed issues and have responsibility for roadside weed management.

FORMAL

Formal communication involves communication between farmers and councils through official mechanisms or systems, such as the property inspection process or registering feedback through the council office. In the most common examples, formal communication was one-way. This was described where farmers make a complaint to their council about roadside weeds (three councils), request roadside spraying (two councils) or list their property on a ‘do not spray’ register (two councils).

It's not as much in the public scheme of engagement, I might get contacted by individual farmers or neighbouring farming properties. (Council)

The existence of these channels for farmers to provide feedback or information to council facilitates communication but does not allow for mutual information sharing.



Other examples of councils' formal communication with landholders may involve two-way communication, but these are primarily led by councils. Four councils described engagement with farmers through formal communication as part of regular inspection processes, issuing of notices or communication about weeds on their property, including roadsides.

We go there and inspect their property with them, preferably in their presence and identify any weeds issues that are an issue or whatever and we're discussing the roadsides and whatever at the same time (Council).

Two councils reported having councillors who are farmers or a formal advisory role for a small number of farmer residents on a weed management committee.

COORDINATION

The coordinated work with farmers occurred as distinct events that were typically initiated by landholder or community group requests but could also be led by council. Staff from three councils described different processes for prioritising weed management that coincided with management on adjoining private properties. This work varied from "more of a reactive approach" (Council) to include further planning, "there was a strategic approach where things were prioritised... if adjoining landholders did their own works, it could be seen to be value-adding both sides of the fence to have that" (Council). One council discussed the process of creating and implementing a management plan with landowners who reach out to council about a specific weed problem from the roadsides.

Few interviewees reported any coordinated or integrated work to manage roadside weeds that involved more than a couple of properties, i.e. there were few examples of where roadside weed management was related to area-wide or community-led weed management programs. One of the two following two best practice examples provide notable exceptions.

INTEGRATED

No council staff described the integrated type of collaboration for roadside weed management. However, a desire for such collaboration was evident among council staff, as well as participants from other organisations. Interviewees explained that the current systems for roadside weed management hindered their developing and sustaining such collaborations. Barriers within the current system hinder communication and more fully engaging with other organisations, "It's not that we don't get along. It's just that there's a stack of laws there that prevent us from getting too engaged, I guess" (Council).

we have to work within certain guidelines because we're a government body and there's oversight and all that kind of stuff, and they're community groups, they can just do what they want. So, there's sometimes a little bit of a disconnect between processes. (Council)

Framing of weed management within the framework of individual responsibility were also reported to be constraining collaboration, "I guess a lot of the weed control we do isn't collaborative because you don't - we're focusing on our assets, we don't spray across the fence or anything" (Council) and "there still seems to be a case of, 'this is

council land', and, 'this is our land', so there is a gap to close there, on how we can manage that a little bit better" (Council).

These themes are explored further under the later report sections addressing councils' needs and how state government can better support roadside weed management.

BEST PRACTICE CASE STUDIES

The following two examples were identified as best practice in collaboration for roadside weed management. These two case studies represent different types and scales of work to manage roadside weeds.

CASE 1: A FARMER AND COUNCIL COMMUNICATING TO MANAGE ROADSIDES

In this case study, the council biosecurity officer used their perspective as a landholder and position at council to develop a plan for herbicide application along roadsides:

I'm a landholder as well, so I understand the use of herbicides, but I've also done a lot of research and time spent into herbicide resistance, so I can see we need to change our way. (Council)

The research on herbicide resistance was shared with a farmer. Their shared acknowledgement of their roles in contributing to herbicide resistance in roadside weeds led to a shift in roadside weed management practices to prevent (further) herbicide resistance developing in certain weeds.

I've seen change in him. So, they're big broadacre farms... When I first met [farmer], they used to put the boom up high in the air, hang it over the fence, and Roundup everything on the side of the road. And then when we started getting more involved in [herbicide resistance weeds research] – I said, "Hey [farmer], this is just continual blanket control." We're going out, council, as well as landholders, and we're blanketing the sides of the roads, or we're blanketing our paddocks, so we're developing our resistance problems. (Council)

The farmer and council now work together to prevent herbicide resistance in roadside weeds. This work is completed independently, but they recognise their impact on one another.

He now manages his roadside, so it doesn't get Roundup anymore. He drives, or we drive the roadside, and we control the weeds, and we're now trying to get native pastures more re-established on the sides of the roads, as well as maybe non-native grasses that can help out-compete weeds. (Council)

Features of collaboration seen in this example include: awareness of different land managers and their issues; the work being led by one organisation, the council; and this example took place across the small scale of the roadside bordering one property. This is ongoing practice relied on the existence of a longer-term relationship between the farmer and council staff member.

CASE 2: COMMUNICATION-COORDINATED WORK AMONG SEVERAL STAKEHOLDERS TO MANAGE WEEDS ACROSS THE LANDSCAPE

The second case study shows characteristics of both communication and coordinated work to manage roadside weeds. This project to manage one priority weed comprised of participation by landholders including farmers, councils, regional organisations, state government agencies and private organisations. A memorandum of understanding provided a framework for the work.

We got [various stakeholders'] permission. We could go onto their property and deal with the problem of this weed... Council would spray on the [land], because we had a memorandum of understanding. (Other)

Private landholders were involved in this project by contributing to the funding and providing permission for other organisations to access their property but work on their property was completed by their council.

We got contributions from local landholders, but that gave us the ability to go onto their land, fence off some things that we needed to fence off, burn other things, slash, spray and do all that on their land, because they gave up that piece of their land for us to manage for the duration of the project to get rid of the [weed] on it. That's a hard pill for a landholder to swallow. (Other)

The successful enrolment of private landholders relied on someone from the program speaking to and persuading individual landholders to take part.

It was personality-driven... but it was somebody going onto a landholder's land saying okay... "We'll take a contribution, we'll put it in with our entire project. It'll cost you \$1,000 to get \$10,000 worth of work done and get this managed within two years, what would normally take you at least seven years to do. That's a good deal." (Other)

This case study demonstrates features of (formal) communicative collaboration with work in being focussed on a single program, and a formal agreement was established between stakeholders. Yet, there are also aspects of coordinated work in the use of local networks, regional scale of the program and time scale of the project.

What do councils need for improved roadside management?

Council staff interviewed described numerous types of support they require to facilitate improved roadside and area wide approaches to weed management, which we have categorised as support from landholders, resources, communication and support from within their organisation.

LANDHOLDER SUPPORT AND PARTICIPATION

Council staff stressed the importance of landholder engagement in managing roadside weeds. Landholder support is fundamental and essential for any collaborative project to begin and be sustained, while the success of area-wide projects is reliant on their participation.



Having landholder support was vital to a council prioritising roadside weed management.

our biggest concern is always going to be the community, because we're a council and all complaints come in through to council... Council's probably biggest concern is to keep the community happy, I suppose, and the rates payers. (Council).

Council staff also identified that resources and within-council support, two of the other enablers of improved roadside weed management, were connected to landholder support. For example, resource allocation toward management of particular roadside weeds or projects can be dependent on landholder support or be directed towards activities about which landholders are vocal.

I think what can happen is community can also - not everyone will be in support of it and community will ask us why are we spending money on [roadside weed management] when the roads are buggered and there's potholes everywhere. So, council always has that tension. So, it really has to be supported by the community for it to happen. (Council)

we get regular requests come through our call centre that there's a species of weed on the side of the road near a certain area, can we please go and treat it? And they're considered customer requests, and they're certainly a priority and they're built into our work plan. (Council)

Three council staff also pointed out that landholders needed to fulfil their responsibilities to manage weeds as a means of supporting roadside weed management.

You're getting those land managers to understand their obligations under the Act. Because weeds are often considered an issue by people, but they're not considered a priority... So, it's getting people to understand there's a hierarchy, but you do have an obligation under the Act and to meet that obligation you should be doing these things. (Council)

Two councils acknowledged that it wasn't enough for landholders to simply fulfil their responsibilities, but also to be open to working together with other landholders to manage weeds.

MORE RESOURCES

Of the 20 councils interviewed, 10 identified a need for increased and continuous funding for effective roadside weed management to occur. Of those councils, three stated that increased funding would allow for staff to have more time to address roadside weeds, more appropriate workloads and more time to apply for additional funding. The funding arrangements in Victoria were noted as particularly challenging because, as one participant noted, "we get the same amount of funding as other councils that are actually smaller and have less roadside" (Council). Participants acknowledged that staffing constraints were directly impacted by lack of sufficient funding.

I suppose it's more resourcing of staff time because you need the money to be able to put in the control measures, but you also need the staff time



to be able to do the planning and the community engagement and running the field days. (Council)

More resources could allow more staff to be more proactive, build relationships, think strategically, plan together and build long-term collaborations.

In some [council areas], they are actually taking the time to take a more proactive approach... sometimes that's a funding issue and sometimes it's dependent on how they can pick up grants as well. (Other)

But the way I can see it, if now I was going to go and talk to shire next door, see if we can do something together, I know the answer is going to be, 'It's already hard for us to get the resources to do it, so we're not going to spend any spare resource to do it with you.' Basically, 'You're on your own, pal,' that's what I'm going to be told. (Council)

With their current resources, councils often make trade-offs in quality or area of roadside weed management, "Every year we have weeds that come out we can't get to because we don't have the funding or money, or resources to do it" (Council).

BETTER COMMUNICATION PATHWAYS

A need for improved communication between stakeholders was identified by seven councils. Within this broader finding, farmers and landholders emerged as the group with whom the councils most wanted to see improved communication. Five councils identified that farmer education was important and needed to be improved (including education on farmer/landholder responsibilities, why certain plants needed to be managed, what plants are weeds and what plants are not, and how to manage plants that are identified as weeds).

If people don't talk to each other as much anymore, they're not as reliant, for example, on those social connections. If they come from a totally different landscape, they don't have a background in rural areas or in farming or in that context. So, for them to understand [their legal obligations to manage weeds] is pretty difficult. (Council)

Two councils stated that they would like better communication and collaboration with other organisations in their area, namely their neighbouring shires and their regional NRM organisation. Activities that were considered to constitute improved communication and collaboration included sharing information such as GPS files and photo points.

The CMA, probably [we want to] have more collaboration with them... if they've got weed problems that they're aware of, they don't let me know. So, it makes it a little bit hard, that sort of communication's not there, that information sharing (Council)

Two councils stated that there was uncertainty around whose responsibility it is to manage roadside weeds, and that it was difficult to ascertain where council's responsibility ended and where the responsibility of the private landowners began. Thus, clearer delineation of responsibility was required for improved roadside weed management to be possible.

And one of the things I'm not 100% sure of, as legislation has changed from when I was young, is who is meant to do most of the weed control. Is



it council spraying, or council through volunteers or is the landowner meant to do a reasonable proportion of the weed control on land outside their roads? ... I'm not 100% sure, and I'm pretty sure most hobby farmers aren't sure either, who has responsibility (Council)

Other ways that councils identified communication could improve to facilitate more effective roadside weed management, each reported by one interviewee, included:

- increased landholder understanding of council constraints and responsibilities;
- improved knowledge of the appropriate organisations and people to talk to about specific weed-related issues;
- collaborative mapping to show where weeds are being managed and by whom; and
- more up-to-date information from other organisations.

WITHIN-COUNCIL SUPPORT

Four councils reported a need for increased support and understanding from within their own organisation. Two council staff members indicated that councils needed to be less 'siloed' in their organisational structure. Rather than departments and individuals working independently, these participants stressed the importance of internal collaboration and communication. A 'whole-of-council' approach was desired.

One of the biggest barriers to getting effective control... is operating outside of a silo set-up. So, you see a lot of councils, they have their roads guys here, and then their parks guys are there, and their biosecurity people are there, and their bushland management people are over here, and none of them talk to each other. So, internal communication and toolbox talks where everybody gets together and talks, that's really important. (Council)

Two councils discussed how important it was for people in other roles or departments within their organisation to recognise the significance of roadside weed management. One council specifically highlighted management as a key actor within council whose support of roadside weed management initiatives was required for such initiatives to succeed:

You really need that buy-in, in the organisation, across the organisation. So, that value has to be shared and that needs to be led by your management. So, there's a need for education and championing (Council).

How can state government support better management?

The majority of interviewees from councils and other organisations identified ways in which the state government can better contribute to area-wide management of weeds, including roadside weed management. These suggestions are focussed on funding, leadership, delivering supporting guidelines and legislation, and communication.



FUNDING

Increased funding emerged as the most-cited action that state government needed to implement to support successful roadside weed management, with 12 participants (six council, six other) reporting that either council or state government agencies needed this increased support. This suggests that funding is the primary concern of interviewees and potentially the largest barrier to collaborative roadside weed management.

Increased funding was required for a diverse range of weed-management activities to be possible, each mentioned by one interviewee, including weed risk assessments, managing widespread weeds, investments into research and development, state management of the roadsides for which they are responsible and for councils to manage land which should be managed by state government agencies, “we’ve always put our hand up for extra funding, to actually manage those state lands because they just will not get managed otherwise” (Council).

Limited funding also prevents management of cropping system weeds that are neither declared priority weed species nor community priority weeds identified in a local weed management plan unless they are incidentally controlled through management of priority weeds.

For us, we have no obligation whatsoever to treat [cropping weed]. In fact, we wouldn't ever be able to treat it because it's just everywhere on the roads, in some cases, and we don't have the resources to treat it. If we stopped treating [weeds with a specific classification], which is our obligation, and focused on agricultural weeds and environmental weeds, the [weeds with a specific classification] would just get away from us. (Council)

Two participants pointed out that changes in how funding was distributed was also needed. Fairer distribution of funding for councils was raised by one other interviewee:

Each council in Victoria gets the same amount of money to manage roadside pests, regardless of how many hundreds of thousands of kilometres of roads they have. So, it's a tiny pie and it's divided up inequitably (Other).

Better timing of funding distribution was identified by one council.

One of the problems, is that the funds being dispersed at a time of year that sort of makes it really difficult for you to do a good job because of the timing. So then you have all this money that you're trying to spend going into the end of the year... And if your contractors are busy doing other things or the weeds, there's just not work for them because it's going into winter, that becomes problematic (Council)

Participants also described the ways in which the length of grants or funding cycles could influence how money was spent. The dominance of short-term funding encourages councils to carry out weed management with more immediate, perceivable effects.



We don't have enough money to look after our roads, so the weeds and verge, we just do what we have to do to make sure there's visibility and that we've done something on the side of the road. (Council)

Funding projects for one to two years also prevents strategic planning. Longer-term funding allows land managers to develop management plans that are more sustainable, and better matched to the timeframes of weed biology and spread.

LEADERSHIP

State government was seen to hold a position of leadership, and there were expectations from some participants as to how that role should be implemented. Four participants from other organisations wanted to see state government support or lead local and regional coordination of cross-tenure management: “collaborative weed management works, but there's no direction on how, how to control it, or any support in making those decisions to say you will” (Other).

Two councils wanted increased interest, support and interaction from state government agencies in roadside weed management. Other participants identified activities by which this could be achieved, including helping to facilitate and support collaboration between state government agencies, and increased participation of agencies responsible for managing roadside weeds along state roads in collaborative efforts, mentioned by two interviewees. Prioritising more strategic and ecologically appropriate management of roadside vegetation was also suggested by another two participants.

One participant emphasised the importance of supporting the coordination of work across different types of linear reserves, “because if you're just looking at roadsides, you're only looking at part of the picture” (Other). Another interviewee suggested that state government could allow municipalities to select their localised weeds of concern, rather than being tied to larger-scale priority weeds lists.

A council staff member mentioned that it was important for state government agencies to help improve the stakeholders' awareness of other organisations and parties with whom they could potentially collaborate with on roadside weed management: “in terms of collaboration... we can tackle weeds on our network, but I guess the first thing is knowing that [partners are] there. So, getting that information out there” (Other). This reflected other participants' observations that it was sometimes unclear who was the appropriate collaborator or person to talk with when it came to specific weed issues.

One council also mentioned that they also wanted to see state government improve the management of the roads for which they are already responsible.

SUPPORTING GUIDELINES & LEGISLATION

Participants highlighted the need for clearer guidelines and legislation to help facilitate councils' roadside weed management. Current legislation was identified by some participants as insufficient in two ways. First, two councils identified a need for state government to provide some sort of legal path to enforce action in non-compliant land managers.

Council doesn't have the right to enforce penalties or fines for negligent landowners. So, if you've got landowners that have invasive weeds and



pests on the property, the [legislation] says that they're responsible for removing that on their property, or responsible for dealing with it. And there's quite a few places of note that that is the case, however, only [state government agency] has the power to do that, and they don't (Council)

Second, one council stated that they wanted to see legal obligations in place to encourage the reduction of weed spread (e.g. via machinery).

In addition to changes in legislation, streamlining systems, policies and processes was raised by three participants as a change that would be welcomed, in order to facilitate improved roadside weed management, and better collaboration with other stakeholders.

We should be able to work more collaboratively and have more streamlined systems, so that the issue I talked about earlier, about contractors being on someone's list but not on someone else's list, there should be better ways to make that not a showstopper, so that you can work across tenure (Other)

COMMUNICATION

Better communication between state government and other stakeholders was highlighted as key to supporting council roadside weed management. Participants presented several ways by which this could be achieved. Education, information, and training were most frequently mentioned by participants, and encompassed a range of knowledge areas including: regularly updated and distributed best weed management practices/guidelines for roadsides (eight participants); weed identification (two participants); project management or grant applications for council staff; and farmer responsibilities and rules.

Three participants also underscored the importance of state government agencies updating information regularly to support councils' weed management activities. Best management guidelines and weed map data were cited as information sources that needed more up-to-date information.

[State government needs] to update maybe even annually the restricted and prohibited weeds. The fact that it's not done on a regular basis, doesn't really help councils be good at their job... If they were to update that, maybe not every year, but let's just say for the sake of saying it, every year annually, then I really wouldn't need to go through the catchment system data, right? (Council)

Three participants identified that there was a need to outline and communicate the responsibilities for roadside weed management among organisations and agencies more clearly. There appeared to be confusion in some places about who was responsible for managing weeds in particular circumstances, "There's regular pushback from councils to ask the state government, and vice versa, about who should be doing what where" (Other).

Two participants wanted to see improved communication from state government agencies about their weed management plans and values. One participant mentioned that it was important to understand "where people put their value" (Council) in order to



ensure that their activities, and how they carried out such activities, aligned. Other communication activities that participants identified as needing improvement by state government agencies were increasing public awareness of the public's obligations under current legislation and sharing resources and developing shared goals.

STATE GOVERNMENT SUPPORT NOT NEEDED FOR ROADSIDE WEEDS

Two council interviewees stated that their council does not need assistance from the state government.

We do have a good relationship with the state government... Now, they're not resourced like they used to be 10, 15, 20 years ago, but they're still there. So, no... I can't really pinpoint any areas where they could certainly provide us with more – either assistance or funding or direction. (Council)

Another interviewee suggested that aside from specific parts of roads, area-wide management of roadside weeds was not the responsibility of the state government.

Concluding reflections

Overall, there is limited engagement between councils and farmers with respect to managing roadside weeds in cropping areas. The engagement that does exist is primarily in the form of education. The two cases of best practice roadside weed management described involved one council working directly with a farmer to prevent the development of herbicide resistance and a council-led cross-tenure program for addressing a priority weed.

Despite the limited evidence to date of collaboration for managing roadside weeds, the interviews have highlighted a widespread belief in the benefits that would accrue if there was greater collaboration among farmers, councils, regional and state government organisations. Yet, the existing systems limit the ability of council staff to engage with landholders and other organisations.

Comments about how the state government can better help councils work with land managers on roadside weeds is in part about clarifying responsibilities, but also being explicit in the extent to which roadside weeds are a priority and in supporting the management of roadsides where area-wide or community-led programs exist.

The following three suggestions, identified by interviewees and researchers, specify opportunities for how councils in cropping areas across Australia could work together with neighbouring land managers to control roadside weeds:

Identify best practice case studies of collaborative roadside weed management in cropping areas.

The best practice case studies presented in this report are two the few examples that have been shared over the course of the interviews. There is a need for more detailed evidence of what successful collaborative roadside management might entail and the benefits it provides.

This could involve the establishment of a project that demonstrates effective area-wide weed management practices in cropping systems, including roadsides. Such a project

could become a successful case study of how a tenure-blind approach could be implemented and operate.

Increase availability of funding for roadside weed management that can be spent over longer timeframes (3+ years).

Longer-term funding will support more strategic and proactive roadside weed management and allow building of relationships that can lead to more sustainable cross-tenure collaborations. Such funding may benefit from specifying the need for evidence that roadside weed management activities are being coordinated with activities undertaken on adjoining properties.

Develop a nationally accessible, updated information source to enable council staff and contractors to identify weeds and learn about current best management practice for their circumstances.

State governments could support collaborative roadside weed management by developing a platform for sharing data on weed locations and management history of those areas, to which councils, contractors, regional organisations, state government agencies and community groups could contribute.



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