Supplementary Materials 2

Expert elicitation of actual eradication cost model for *Andropogon gayanus*: measuring the accuracy of modelled costs

To test the accuracy of our gamba grass management cost model we elicited actual eradication costs from two weed control experts who are currently actively engaged in gamba grass management on a large property. We elicited the cost inputs for each infestation in the region they are managing. For each infestation we first asked for a description of the infestation including size and density and the control strategy used. We then asked the managers to estimate the components of the cost function: labour (L), equipment (E) and chemical (C) applied with the following questions:

1. Labour: please list the number of personnel, number of days and average hours per day spent managing each infestation in the last year.
2. Equipment: please list the equipment used (boom spray, backpack sprays, 4x4, quads) to manage each infestation in the last year.
3. Chemical litres per hour used: please provide the average chemical litres per hour applied of glyphosate to each infestation and indicate if this rate differs between equipment type.

We then asked whether the team undertook annual planning (P) and monitoring (M) and if so the number of staff hours allocated and equipment used.

Lastly, we asked how many years (t) each infestation had been treated for and how effort had varied over time and how many additional years of treatment the team expected in order to complete eradication of the infestation.

In the region in which the managers are actively managing gamba grass there are 7 infestations that they allocate their time across. They therefore answered the above questions by each infestation, detailing the history of management of the infestation (t) approach taken to manage the infestation (E,L and C) as well as the time of year treatment occurs. Lastly, they discussed how monitoring occurs while they treat the infestation and planning is taken for the full region once a year including a helicopter survey of the region (total planning cost of $7100 pro-rated by area across infestations for comparison with Centrogen costs).

A summary of the infestations and the components of the cost function provided by the managers is given in Table 1. In order to compare total costs we assumed the same per hour equipment (variable), labour ($58 per hr) and chemical ($0.20 per l) rates provided by Centrogen. We calculated actual management cost per infestation based on the equipment, labour and chemical costs detailed in Table 1 and including the pro-rated planning costs by area of infestation (total planning cost of $7100) (actual costs provided in Table 2). We used the eradication cost model in supplementary materials 1 to estimate cost per infestation based on area, density, year and access (Table 2). We also compared the actual labour hours to estimated labour hours as this is the unit by which all other inputs are measured (i.e. equipment and chemical costs are by hour). The actual labour hours were higher than the estimated labour hours (Table 2), which is most likely related to the managers including monitoring time in their treatment time rather than tracking as a separate cost input. Labour hours across the seven infestations were highly correlated with estimated labour hours (R^2 = 0.9534, Figure 1). The total actual cost across all infestations was ~6% higher than the estimated total cost and was highly correlated across the seven infestations (R^2 = 0.975, Figure 2).

Table 1. Eradication cost components for seven infestations. Details of the seven infestations being actively treated for eradication by the two land managers including cost model inputs (E, L, C).

ID	Density	Year	Area (ha)	Access Issues	Equipment used	Labour description	Labour hours	Chemical l per hr
1	medium	4	106	Yes	2 quads	3 days, 4staff, 8 hr/day	96	170
2	scattered	2	21	Yes	1 quad	3 days, 1 staff, 8 hr/day	24	70
3	medium	3	225	No	2 4x4s	2 weeks dry, 4 staff, 7 hr/day due to slow travel to site and 3 days wet, 3 staff, 6 hr/day due to conditions	334	170
4	scattered	3	34	No	2 4x4s	4 staff at 1km per day along road (4x250m grid cells), 8hr/day	44	170
5	scattered	3	25	No	2 4x4s	1 day, 4 staff, 8hr/day	32	170
6	scattered	4	725	Yes	1 quad	Wet season (~3.5 months working 5 days per week), 1 staff, 8 hr/day	560	70
7	medium	4	44	Yes	2 quads	1 day, 4staff, 8hr/day	32	170

Table 2. Actual and estimated eradication costs for seven infestations. By infestation relevant details for the cost model are given as well as actual and estimated costs and actual and estimated labour hours.

ID	Density	Year	Area (ha)	Actual cost ($)	Estimated cost ($)	Actual labour (hr)	Estimated labour (hr)
1	medium	4	106	17,854	21,522	96	88
2	scattered	2	21	2,910	3,876	24	24
3	medium	3	225	79,619	67,408	334	305
4	scattered	3	34	10,402	6,544	44	26
5	scattered	3	25	7,649	4,056	32	20
6	scattered	4	725	69,314	70,548	560	360
7	Medium	4	44	6,003	9,064	32	37

Figure 1. Actual verses modelled labour hours by infestation (n=7).

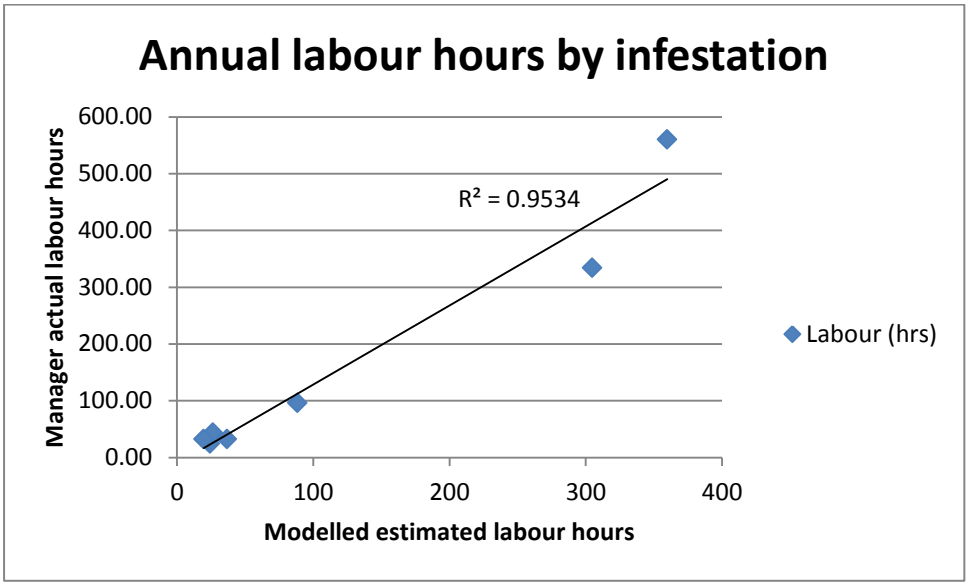

Figure 2. Actual verses modelled annual eradication costs by infestation (n=7).