

## Sacrificing innocents to get the outlaw – the benefits of early control

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**Summary** Accepted weed wisdom says that it is better to control weeds earlier rather than later. But when a plant species is at a very early stage of invasion, often we don't know its potential for damage in the new area. How does one decide if eradication is worthwhile when a plant's potential weediness is unknown? We could delay control until the new plant proves itself a weed. Alternatively, we could control all newly naturalised plants – both those that would have proved benign and those that would have been problematic if left.

This study set out to test if controlling all newly naturalised plants could be cost effective. We used two approaches.

### 1. Actual costs of control.

We compared the typical cost for controlling a weed infestation at three different stages of invasion:

- i. first detection;
- ii. small but still eradicable infestation; and
- iii. widespread or dense infestation.

We used the information from 58 weed control projects, some for each of the three infestation stages.

### 2. Modelling cost of control over time.

Weed spread was modelled using different scenarios of spread and infestation and estimates for typical times taken for a weed infestation to progress to each stage. We analysed the concomitant change in control costs at 5, 10, 20 and 40 years from establishment. This was used to predict the cost implications of delaying weed control.

The costs of weed control operations are largely labour – in the order of 65–70% of the total. This includes both searching and the control operation itself. The size of the area to be searched to ensure complete control is the most important driver of control costs. Effective control is possible at an early stage for a very limited cost—an average of \$463 for infestations ranging from just a few plants to 400 m<sup>2</sup>. By contrast, our data suggest that if a plant is left and turns out to be a weed requiring control, the average cost when it is eventually controlled is equivalent to \$47,000 at the time of first discovery.

If a plant is a known weed for the area, early control i.e. at the time of discovery, compared with late stage control gives an average benefit cost ratio of 15. If the plant's weediness potential is unknown, there will still be a net benefit to its early control if this can be achieved for less than \$7000.

The modelling indicates that when even a moderately invasive weed spreads from its original infestation to form just one new satellite the costs of control increase dramatically. In part this is because of the burgeoning cost of searching as the weed spreads.

The results from this study confirm that early control is the best strategy for both known weeds and for newly naturalised plants, the weediness of which is yet unknown. Our analysis suggests that the benefits of catching bad weeds early compensates for controlling a number of non-harmful species. We cannot afford to 'wait and see'.

**Keywords** Control benefit analysis, early intervention, environmental weeds, weed control costs.