

Appendix 3

Guidelines for Calculating the Economic Impact of Weeds of Primary Industries

Introduction

No unified datasets are available which allow the calculation of a weed species' economic impact on primary industries at a national level. Therefore the following shorthand method has been developed to derive this information from member States in a practical and cost-effective manner. It should be noted that this information is being used to determine weed species relativities, and therefore uniformity of approach is more important than the absolute economic value of a weed's impact.

In addition, each State will probably have developed their own economic framework for valuing the economic impact of weeds. This would make comparisons between different State figures extremely difficult.

Economic modelling systems would allow a greater degree of precision including wider industry benefits and social costs to be calculated. They are however, resource and data intensive which makes them time consuming.

This is also the first round for establishing Weeds of National Significance and the process will be refined in the light of experience as a result of this exercise.

Rationale

The availability, understanding and use of gross margins is widespread in agriculture. Given the availability of gross margins across different farming systems and regions, the management costs directly associated with weed control should be readily available or obtainable. Similar economic measures are also available for forestry. This would allow quick estimates of the economic impact of a weed on a representative production system for particular industries to be made. For widespread industries, estimates would need to be made at the regional level. The disadvantages of this approach are that the technique is static in nature, ignores wider industry benefits and social costs and represents only the "average" economic impact of weeds. It does however, allow a direct comparison of values between weeds.

The management costs directly associated with weed control are the costs of herbicides and their application, and limited mechanical or other practices such as the pulling of woody weeds or inter-row tillage of weeds, or targeted grazing. More importantly, for Weeds of National Significance (WONS), the impact is to be considered under best practice situations.

This would entail only considering the costs of weed control where best management practices are used (activities undertaken at the correct time using appropriate resources) and sound commercial control results. If weeds are not being managed properly, then factors such as decreased pasture and crop yields are more a result of poor management decisions, resulting in a delayed economic cost, rather than an up-front cost specifically targeting a weed's impact.

The calculations would ignore indirect costs such as:

- **general tillage operations** on the basis that the majority of cultivation is undertaken for reasons other than direct weed control
- **yield losses** which are a consequence of a number of factors, some controllable under management practices such as the variety chosen, rotations, the amount of fertiliser, time of sowing, and overall management of the crop/pasture. Other factors are not controllable such as climate, soil temperature and some diseases. To equate yield loss (and therefore economic impacts) directly to weeds, assumes that all other factors are at an optimum. This rarely, if ever, is the case in the field. It also ignores management considerations. Weeds are part of primary industry systems and are an indirect consequence of partaking in those systems
- **product contamination** which is often a result of management decisions and which should be contained/minimised through adequate planning and cultural activity.

Methodology

For weed species nominated by your State or Territory — for each of these species identify the industries that a weed impacts upon, and develop the following information which must be fully detailed along with any assumptions used in the calculations. This will allow for easy verification:

- the type of crop, livestock or other enterprise
- the region to which the figures apply
- the average area of the particular enterprise (use 10 year average figures)
- an estimation of the average proportion of area treated (sprayed/mechanical operation) for that region under best management practices
- the herbicide(s) used and method of application
- the mechanical operations undertaken
- the average cost of the herbicide(s)
- the average cost of application(s)
- the average mechanical and other costs
- for each herbicide treatment (herbicide plus application costs) an adjustment will be required, which is an appropriate discount factor that allows for the fact that not all herbicides are applied to the target weed alone.

Discount Factor	Applied Under the Following Circumstances
1	WONS species weed specific herbicide or when the herbicide is applied to only control the weed in question
0.75	broad spectrum herbicides when the weed in question is the dominant weed targeted
0.5	broad spectrum and non-specific herbicides where the weed in question is one of the major weeds targeted
0.25	broad spectrum and non-specific herbicides when the weed in question is not the major weed targeted

- list an average crop, livestock or other enterprise gross margin (use 10-year average figures) on a regional basis.

Calculate an average total control cost for the weed in question, by industry. Where possible, provide a regional break up of the calculation. Please note that this is the control cost for the weeds infested area, which would be routinely treated at best practice levels (not the control cost if the total area was treated).