

THE THEORY AND PRACTICE OF NOXIOUS WEED DECLARATION

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Summary. The declaration of plants as noxious weeds is discussed in terms of the criteria and the practical aspects which have been used in making such decisions in the past. Control of noxious plants involves the use of significant quantities of public monies which must be justified in terms of the results obtained. A series of suggestions is advanced which need to be considered when making changes to the present systems in the various states. The desirability of categorising noxious weeds into groups according to the seriousness of the problem, extent of infestation and the land use of the area, is advocated.

INTRODUCTION

Tradition has been that, providing it does not adversely affect the neighbours, all owners/occupiers of land can make their own decisions on whether to control weeds and if so the amount of control to be achieved. Some weeds, however, have a significant detrimental effect on agricultural production or the environment, and in these circumstances it is considered desirable in the general interest that each and every individual carry out certain control activities. This interference with the rights of individuals to make their own decisions requires legislative authority. The weeds for which action is required are designated as "Noxious Plants", "Noxious Weeds", "Declared Plants" or "Pest Plants".

Noxious weed legislation started in the U.S.A and Australia towards the end of the 19th century and has spread to many countries. The concepts upon which current Australian legislation is based have been the subject of numerous discourse (1, 4, 5) and are still open to debate. Menz and Auld (3) suggest that the principal aim of noxious plant legislation should be to minimise the economic externalities or effects which arise through the spread of weeds from infested to uninfested land.

In Australia, the main emphasis of noxious weed legislation has been firstly to prevent importation of propagules, secondly to prevent spread within Australia, and thirdly to control (eradicate) those weeds that threaten the livelihood, health and general welfare of the community including weeds which threaten to degrade the environment (9).

Quarantine and seeds legislation aim to limit the introduction and spread of weeds into and within Australia and will not be dealt with here. Noxious weed legislation within the States under various names is enacted to help prevent spread and to control existing infestations.

Weeds are dynamic organisms, constantly moving around within their environmental limits depending on climatic conditions and the management practices imposed by man. Legislation concerning those plants considered to be noxious must be flexible enough to adjust to the changing abundance, distribution and economic importance of weeds as well as the changing social attitudes and emphasis on these weeds.

Spear thistle, *Cirsium vulgare* has been proclaimed since 1856 in Victoria. Legislation appears to have had little effect on the abundance of the weed as it is still found throughout the State and is widespread in other States. It

would appear there is little justification for retaining this species on noxious plant lists.

The abundance, distribution and economic importance of skeleton weed, *Chondrilla juncea* has changed considerably in eastern Australia since biological control was introduced and this has influenced attitudes towards its declaration as a noxious plant especially in N.S.W. where it has been removed from many local area lists.

The dilemma facing all legislators is to decide whether the forced action to control noxious plants justifies the infringement of personal liberties and will receive public support or whether public demands for plants to be declared noxious are in the best interests of all concerned.

Ideally plants should only be declared as noxious weeds on sound economic and biological considerations. An understanding of their biology and place in the ecosystems which they have invaded is essential (7).

CRITERIA FOR DECLARATION

Legislation dealing with noxious plants usually does not provide guidance as to the criteria to be used in making decisions on the "noxiousness" of a plant, and it is the responsibility of the relevant state authority for administering the legislation to decide if the threat posed by a weed is sufficient for it to be proclaimed under the relevant Act as a "Noxious Plant".

Thus an element of judgement must enter into decisions relating to declaration and for this reason it is difficult to set down a list of firm criteria against which a plant can be evaluated. However, it is possible to make a list of the sort of information that should be considered in making that decision.

1. Evidence to show that the plant causes, or has the potential to cause, serious economic loss to agricultural production or harm to the environment through invasion and dominance of natural vegetation.
2. Evidence that the weed is likely to spread from its present distribution to other areas.
3. Evidence that the weed is poisonous or harmful to humans or animals.
4. Information on the actual and potential distribution and abundance of the plant.
5. Evidence that effective and practical control measures are available.
6. Indications that action taken under legislation would be expected to be effective and result in at least partial reduction in areas infested.
7. Availability of a plan of the proposed programme of control or eradication for the area.
8. An assurance that there is a firm intention to initiate, maintain and if necessary, enforce the measures required under the programme.

Amor and Twentyman (1) presented a flow chart to help with the reasoned

assessment of weeds for "noxiousness" but it does not appear to have been widely adopted.

In the past weeds which cause economic loss to agriculture and threaten rural areas have been predominant in declared lists. However, weeds of public lands which threaten to degrade the environment (e.g. Scotch broom, *Cytisus scoparius*, at Barrington Tops, N.S.W., Bitou bush/boneseed, *Chrysanthemoides monilifera*, in coastal areas), and those that affect human health and recreation should also be covered by legislation although it may be uneconomic to control those weeds in inaccessible locations or on low value land. Due regard must also be made of the likely effects of noxious weeds in public lands on neighbours, and control is essential in buffer zones around National Parks, State Forests, and other Crown Land areas.

Also weeds declared as noxious for rural areas may not be of concern to Crown Land managers, and vice versa. Thus an understanding of each other's problems and attitudes towards the meaning of "noxiousness" is necessary.

The reasons for the proclamation of a weed and the benefits that should accrue from its enforced control should be clearly spelled out to the community. If it is uneconomic for a landholder to control a weed it is likely to be uneconomic for the community to do so.

CATEGORIES FOR NOXIOUS WEEDS

As suggested by Amor and Twentyman (1) it seems desirable to have noxious plants categorised or tiered into groups depending on the seriousness of the problem, extent of infestation, and the land use of the area. The following categories have been suggested.

1. Prohibited Plants (P1) Plants known to cause major problems to either agricultural or non-agricultural areas, but which are of very limited distribution or do not occur in the State, and includes plants proclaimed as drug plants. Eradication is mandatory where these plants are present and the cost of control should be borne by the State.
2. Priority Noxious Plants (P2) Plants posing a major threat to either agriculture or the environment, including plants which are present in part of the State and which have the potential to spread to other areas, or which are of such significance as noxious plants as to be given a high priority. Destruction is required where infestations are small otherwise control or containment is required. The owner/occupier of the land bears the cost of control.
3. Noxious Plants (P3) Plants which adversely affect or are detrimental to agricultural and non-agricultural areas, the environment, or the community in some way. These plants are often well established in an area but control measures are enforced because the weed is a threat to adjoining uninfested areas, is likely to spread through contamination of agricultural produce, livestock and equipment, affects the health of the community, or is capable of invading natural areas. Effective control measures are available at reasonable cost. The owner/occupier of the land bears the cost of control.

This group can be divided into four sub-categories depending on land use:

- (a) Agricultural areas

- (b) National Parks
- (c) State Forests and other Crown Land areas
- (d) Urban and recreational areas

4. Local Noxious Plants (P4) Plants which local communities consider a problem and are prepared to enforce control.

The reasons for the last two categories are much less clear than the first two, as the plants may be widespread in some areas and not others.

PRACTICAL ASPECTS

In the past the actual proclamation of weeds as noxious plants has probably been influenced more by people's attitudes and politics than by theoretical considerations. After all, the final declaration is a political decision (1).

Regular reviews of the lists are essential and these must be associated with consultation with scientific and local community groups. However, it is often difficult to decide just how much weight scientific or local community groups should carry, as they may be widely divergent in their views of 'noxiousness'. Declarations based on biological and economic grounds involve expert opinion by highly skilled personnel yet their conclusions may be at odds with how the community perceives the plant.

Bodies charged with making these decisions must be aware of these conflicting aspects and reasoned decisions made. Too often in the past they have been influenced by the attitudes of the community and the pressures exerted by individuals and political figures sometimes with a vested interest. There are examples of conspicuous plants declared noxious for apparently no other reason, (e.g. Paterson's curse, *Echium plantagineum*, and spear thistle) (1).

Also once a plant has been proclaimed for some time the community is convinced firstly by publicity, and finally by tradition, that it is undesirable to remove that plant from the list, (e.g. saffron thistle, *Carthamus lanatus*, and spear thistle in some areas of N.S.W.).

If one examines noxious plant control and the public purse, large sums of money have been spent annually by authorities over a long period of time, often with little to show (5). One is entitled to ask just how effective noxious weed legislation has been. The record for weeds widely distributed such as blackberries, *Rubus fruticosus* and St. John's Wort, *Hypericum perforatum* does not appear good. However, it is difficult to say what the situation would be if that money had not been spent. Possibly the money could have been spent in a more effective manner.

On the other hand, there are instances of very successful control or eradication programmes but these have been mainly on small areas or small infestations: perennial ragweed, *Ambrosia psilostachya*, poverty weed, *Iva axillaris*, and water hyacinth, *Eichhornia crassipes* in Victoria (5, 6); creeping thistle, *Cirsium arvense* in W.A. (5); serrated tussock, *Nasella trichotoma*, in Tasmania; and water hyacinth in S.A. (6).

However, questions are being asked just how far in terms of cost can W.A. and N.S.W. go in trying to eradicate skeleton weed and parthenium weed, *Parthenium hysterophorus*, respectively. In today's financial climate an economic evaluation of resource allocation would seem necessary to decide if,

or just how much, Government should be involved, as well as how much the

community can bear (8).

The concepts on noxious plants legislation outlined in the paper by Amor and Twentyman in 1974 (1) are still valid today. However it is interesting to see that several of their proposals are only now being adopted and implemented 13 years after they were suggested e.g. categorisation of noxious plants, reduction in plants on lists, and considered assessment of noxiousness.

Changes in the concepts of noxious plant legislation are often slow to be adopted but are inevitable in today's economic constraints.

CONSIDERATIONS

1. The term "noxious" is applied too freely in a social, political and legal sense. A common attitude is that by declaring a weed "noxious" it will simply go away. In an agricultural sense all plants that interfere with production are noxious and one would need resources and technology beyond the realm of an average landholder to manage them so they will not cause any harm. We need to be more mindful of the actual economic losses caused by plants declared as noxious weeds and it is pleasing to see W.A. tackling this problem with economic models and biological considerations (7, 8). Also the term "declared plants" would seem to have less emotion associated with it and be more applicable than "noxious plant".
2. Noxious weed lists should be greatly reduced and should only include prohibited plants (drug plants), and those with serious weedy characteristics and that occur in small enough areas so that eradication can be considered a possibility i.e. only P1 and P2 of the categories described earlier. Lists must be reviewed regularly and reflect changing attitudes and knowledge about particular plants.
3. As suggested by Moore (5), weeds that spread despite efforts to control them, should be taken off lists but where such weeds do actual or economic harm, efforts to control them should be made through special advisory programmes.
4. Landholders and occupiers of land including the Crown, must accept that they have a responsibility to the community around them, and the environment in general, to control all weeds whether they are noxious or not. The problem is that we as human beings all have different attitudes and expectations of what should be done or what is acceptable, and this is where Government intervention is necessary.
5. Noxious plant control authorities and research bodies must provide more realistic and economical control programmes than in the past; these programmes should encompass the so called "integrated control approach". Eradication, except in special circumstances, is just not economical today. We have to learn to live with levels of most of our weeds which allow us to produce our crops and our animal products, and to enjoy our recreation areas and environments. For most weeds, the days of complete control (eradication) is a figment of our ideals of the past, and we must accept the economic realities of the situation.
6. We need to look to a more early containment or eradication of introduced plants likely to become widespread. The public, especially landholders and environmental groups, should be encouraged to be more vigilant in observing new plants in an area, and to report observations to

appropriate authorities.

Groves has recently discussed this issue (2). Management or eradication options are more practicable and economical in the early stages of introduction, yet little attention has been paid to this aspect in Australia. Four or five new plants are introduced into Australia each year. How many of these become naturalised and finally weeds is not known, but a much greater effort is needed to learn about these plants and their potential to become noxious plants.

7. There is a need for more research on:
 - (a) The actual economic impact of weeds. We have little evidence that plants such as saffron thistle, fireweed, *Senecio madagascariensis*, or spear thistle, cause economic losses.
 - (b) Historic studies of plant invasions. Careful attention should be paid to taxonomy and biology, so that we can predict which plants may be most likely to enter Australia and become naturalised, their potential distribution, and the impact they may have on Australian ecosystems.
8. Special efforts should be made to evaluate the effectiveness of noxious plant control programs in light of the considerable sums of public money which have been used in so called 'eradication programs'.

CONCLUSION

The declaration of plants as noxious plants, declared plants, or pest plants, must reflect the changing economic, social and scientific attitudes of the community. However, there is a need for a more reasoned biological and economic approach for determining those plants which should be proclaimed as noxious plants. As well, efforts should be made to evaluate the effectiveness of such declarations, as considerable sums of public money have been expended on control programs, yet noxious plants still flourish.

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