

ENABLING LEGISLATION FOR BIOLOGICAL CONTROL

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Summary. Introduced weeds cost Australia well over \$2,000m annually. For some weeds biological control is the only option for economically-and environmentally-sound management. There are two main obstacles which limit biological control of weeds in Australia. The first obstacle is lack of adequate support. The second obstacle is conflict-of-interest in choice of target or agent. The world's first legislation for biological control, the Commonwealth *Biological Control Act 1984*, was passed to allow objective resolution of such conflicts. Complementary State and Territory legislation is expected to be in place by the end of 1987, and will establish an effective Australia-wide system for resolution of conflicts.

INTRODUCTION

There are no accurate estimates of the total actual or potential damage to Australian agriculture by introduced weeds, but it clearly would be measured in the thousands of millions of dollars annually. For example, an estimate of costs due to weeds in 1985-86 in Australia is \$2,500 to 2,750m (3).

Three strategies for management of introduced weeds have traditionally been used in Australia: chemical (applying herbicides); cultural (discing, hoeing, crop rotation, etc.); and classical (inoculative) biological control (using host-specific natural enemies from the home range of the weed). All have a place in the management of weeds; however, the first two are often very expensive, ineffective over long periods of time, and can have damaging environmental consequences.

Classical biological weed control, while not a panacea, is often the only relatively inexpensive, specific, permanent and environmentally-safe option for management of introduced weeds. It also has the advantage, like the other two strategies, of being able to be used as a component of integrated weed management where this technique is suitable. Other types of biological weed control, such as development of mycoherbicides (a type of inundative biological control) are potentially important, but have only recently been examined in Australia (2).

There are two main obstacles to implementation of biological weed control in Australia. The first is that, as a procedure offering great potential to manage economically weeds that cost Australia so much annually, it is certainly underfunded in Australia. One estimate (12) is that if a given biological control project resulted in just a 1% increase in naturalized pasture productivity in the southern wheat-sheep zone, the project would pay for itself. Obviously, the potential for much greater increases in pasture productivity than 1% are associated with most biological control projects. Other benefit:cost ratios are strongly in favour of biological control of weeds; e.g., up to 200:1 for skeleton weed, *Chondrilla juncea* L. (11), 60:1 for blackberry, *Rubus fruticosus* L. agg. (9), and at least 9:1 for Paterson's curse, *Echium plantagineum* L. (10). Clearly, greater funding for biological weed control is justified.

The second main obstacle to implementation of biological weed control is conflict-of-interest. The remainder of this paper discusses this point, and how Australia leads the world in a legislative solution.

TYPES OF CONFLICT-OF-INTEREST IN CLASSICAL BIOLOGICAL WEED CONTROL

There are two main areas of conflict-of-interest in classical biological control. The first involves choice of target weed; most conflicts fall into this category. The second is choice and likely impact of agent species; this involves a very diverse group of interests. The subject has recently been reviewed for Australia, New Zealand, South Africa, the United Kingdom (through CAB International, formerly the Commonwealth Institute of Biological Control), and the USA, for phytophagous fish and phytopathogens, and for several case histories, including Patterson's curse and blackberry in Australia (6).

It may seem obvious that certain introduced species (e.g. Patterson's curse, thistles, blackberry, etc.) are, on balance, weeds. However, most conflicts-of-interest involving choice of target weed stem from differing perceptions of the value of a given plant species. Apiarists in particular have been active in promoting introduced, early-flowering ground flora, and have opposed programs for biological control of these plants (5, 7, 8). Many types of conflict-of-interest over the value of a plant species can arise (e.g., aesthetic, ecological, economic, ethical, legal, and scientific (13)), but normally economic considerations are paramount.

Even if the choice of target weed is not controversial, the choice of agent species can be. For weed:agent combinations such as Patterson's curse and its tested natural enemies, choice of both are challenged by interest groups which want to stop the program (5, 7, 8). Because classical biological control involves the importation of exotic agents, it is critical that long-term and detailed host-specificity testing is done to ensure that the agent will not become a pest; i.e., that, after release, it will be restricted to one weed species or an acceptably-restricted group of closely-related weed species. It is important to remember that, while some agent species have been able to complete development on native plant species after introduction (e.g. 1, 13), this is predictable and has not placed the native species at risk of serious damage. No agent introduced after proper host-specificity testing has ever become a serious pest of non-target plants in its introduced range.

Targets and agents are, therefore, carefully selected, and safety of agents (rather than their likely efficacy) is the main criterion controlling agent selection and approval for introduction. Despite this, serious conflicts-of-interest have risen, and legislation was necessary in Australia to allow them to be resolved.

CHALLENGES TO BIOLOGICAL WEED CONTROL IN AUSTRALIA

Although delays to implementation previously occurred due to challenges to classical biological weed control in Australia involving skeleton weed, Noogoora burr, *Xanthium pungens* Wallr., blackberry, etc. (5), none halted a program. It took the challenge to Patterson's curse, which stopped the program in July 1980, to make workers realize that biological control needed to be placed on a firm legal footing (5, 8, 10).

In brief, Patterson's curse was listed as a priority weed by the Australian Weeds Committee (AWC) in 1971, and work began. From 1971-75 this priority rating was confirmed unanimously by the AWC. In 1978, apiarists claimed that they just became aware of the program, and lobbied Ministers and CSIRO to stop the program. In 1978, CSIRO proposed to the AWC that the Standing Committee on Agriculture (SCA) form a Working Party to resolve the conflict. The AWC did so, but SCA rejected the proposal and recommended initially that the program should not proceed. Australian Agricultural Council (AAC) did not

accept the SCA recommendation and referred the matter back to them for a report. This was delivered, and SCA then recommended, and ACC accepted, that the program should proceed. Apiarist lobbying resulted in the matter being reconsidered, but in 1979 CSIRO was authorized to proceed with unanimous agreement of AAC, SCA and AWC.

In late 1979 CSIRO imported agents, and the first releases were made in mid-1980. Two apiarists and two graziers obtained an interim injunction from the High Court in July 1980, which prevented further release of agents. Expert legal advice was that CSIRO could lose the case on points of law, which would set a precedent affecting all future biological control programs, so CSIRO accepted a perpetual injunction in 1983, in the knowledge that legislation to protect biological control and to resolve conflicts-of-interest was being prepared.

ENABLING LEGISLATION FOR BIOLOGICAL CONTROL

One tangible result of the Patterson's curse conflict-of-interest is passage of the *Biological Control Act 1984* (4). The *Act* is discussed in detail by Cullen and Delfosse (5). Important general provisions of the *Act* are: establishment of a Biological Control Authority (BCA), with wide-ranging responsibilities; provision for conduct of one of three types of Inquiry to resolve conflicts-of-interest; reciprocity with similar State *Acts*; and importantly, legal authorization for release. These points are discussed briefly below.

Establishing the position of BCA is a critical part of the *Act*. From 22 November 1984 (date of commencement of the *Act*) this position has been held by Mr Kerin, Minister for Primary Industry. There is a provision for the BCA to be either a Commonwealth Minister or a Minister of a State which has passed complementary biological control legislation. The BCA oversees the two types of declaration of target organisms by either receiving a recommendation to that effect from AAC or receiving applications for declaration. In the latter case the BCA (after determining that action has not been taken or is not in progress on the organism under either State, Territory or Commonwealth legislation) refers the application AAC. AAC rules on the application, and the BCA informs the applicant. If AAC recommends declaration of the target organism, the BCA must publish the intent to declare, which invites comment, and must consider all comments. If, after this, the BCA thinks that not enough information is available on which to make an objective decision, the BCA can initiate an inquiry. The results of the inquiry must be made known before the BCA can rule on the recommendation to declare the organism as a target organism.

The procedure leading to declaration of agent organisms is identical to that for declaration of target organisms, except that, following a recommendation from AAC to BCA to declare the agents, BCA must advertise only in the *Government Gazette*, not also in appropriate newspapers or journals.

Finally, the BCA can declare by notice in the *Gazette* target organisms and agent organisms under emergency provisions (e.g., after discovery of a new aphid species which could potentially cause significant damage) and can approve targets and agents worked on before the *Act* came into effect. Inquiry provisions are critical to resolution of conflicts-of-interest. Three types of Inquiry are possible under the *Act*: a "Part VII Inquiry"; an "Industries Assistance Commission (IAC) Act 1973 Inquiry"; and an "Environmental Protection (Impact of Proposals) (EPIP) Act 1974 Inquiry". In a Part VII Inquiry, Commissioners and advisors are appointed to investigate if a potential

biological control program is in the nation's interest, if awarding of compensation is appropriate, and any other matter it judges appropriate. Such a Commission can summon witnesses and evidence is taken, but the Commission is not bound by the "rules of evidence". The latter point is important, and means that anecdotal evidence or hearsay can be presented. Obviously this would apply to both sides of the controversy, so Commissioners could have difficulty evaluating some information. In general, this is a good provision, because it allows a Weeds Officer or similar person to give evidence of the situation in his or her area of responsibility; otherwise, each landowner would have to report to the Commission separately.

An *IAC* or *EPIP Inquiry* is conducted in essentially the same way as an *Part VII Inquiry*, but more specifically refer to compensation or environmental matters, respectively.

The *Biological Control Act 1984* applies only to the Australian Capital Territory, and by declaration, to other Australian Territories (Cocos, Christmas, Coral Sea, Ashmore and Cartier Islands). It is important that each State and the Northern Territory enacts complementary biological control legislation.

At this writing, all States (except Queensland) and the Northern Territory have done so, and either have declared, or are in the process of declaring, their *Act* complementary with the other State and Commonwealth *Acts*. It is understood that Queensland will soon pass their *Act*, and it is hoped that all States and Territories will declare the complementarity of each other's legislation by the end of 1987. This will provide good protection for biological control programs.

I had intended to compare and contrast the various State and Territory *Acts* with the Commonwealth *Act* in this paper. Unfortunately, since all State and Territory *Acts* are not in place, this would be premature, and will have to be discussed in a future paper.

Another important provision of the *Act* is legal approval for release of approved agents. Amazingly, until passage of the *ACT*, there was no legal approval for CSIRO or other groups to release the agents which they had studied! Once approved, agents can be released *in perpetuity*, unless the approval is revoked.

Finally, once agents are declared, no court action can be instituted (or continued) to prevent their release, or to recover damages caused by their release. This may be important in the current Patterson's curse situation.

It is important to note that: it is not necessary to utilize the *Act* for a given biological control program (but any program not covered by the *Act* could be subject to legal challenge); the *Act* covers *all* types of biological control programs (i.e., not just weeds); and it is not necessary to have agents declared, but if it is important to do so, the target must be declared first or simultaneously (i.e., targets can be declared without agents, but agents cannot be declared without first having targets declared).

IMPLICATIONS OF BIOLOGICAL CONTROL LEGISLATION FOR NOXIOUS PLANT ADMINISTRATION IN AUSTRALIA

It will be important to determine the relationship, if any, of noxious plant legislation to the State, Territory and Commonwealth biological control *Acts*. As indicated above, a detailed discussion on this point will have to await

final passage and declaration of all *Acts*. However, a few general points can be made now.

The two types of legislation are not related in the legal sense. Even though they set out to accomplish a similar goal (management of weeds), there is no cross-referencing. This should not affect implementation of biological control programs. Noxious plant legislation generally gives wide discretionary powers to Councils. A landowner who is co-operating in a biological control program is attempting to control the weed, which fulfills the legal requirement. This is important, because such co-operators often provide plots of land on which chemical or cultural control attempts of the weed must be halted for a period. It is difficult to see how biological control could function as well as it does without this co-operation.

Similarly, the biological control legislation should not impinge on implementation of noxious plant control programs. Apart from the relatively few locations at which releases of agents are made, normal management of declared plants can proceed unaffected.

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