Principles of weed legislation

H.P.C. Trumble
Plant Pests Commission
Box 1671 G.P.O., Adelaide 5001, South Australia

INTRODUCTION

Over the past 20 years, the legislative framework for control of noxious weeds has been progressively transformed. In the 1950s weed control laws were characterized by lack of sound scientific bases, haphazard or non-existent enforcement and the absence of any significant co-ordinating capacity to deal with matters outside local boundaries, let alone on a State-wide or national basis. The year 1958 saw the introduction in Victoria of the legislation which set up the Vermin and Noxious Weeds Destruction Board, which has since come to be regarded as the pace setter in weed control in Australia. Since 1958, there have been significant amendments to the State laws for weed control, culminating in a rash of changes in the last five years. In 1974, Tasmania amended its legislation to place the emphasis on centrally directed and enforced control. South Australia passed its new Pest Plants Act in 1975 to establish a co-ordinating and managing Commission to work in new ways with local authorities and to deal with non-agricultural weeds. Western Australia replaced its older legislation with the Agriculture and Related Resources Protection Act in 1976, integrating weed and vermin control, providing for the inclusion of other types of pests within the same framework and establishing an interlocking network of local and central authority. The Queensland Government in 1975 commissioned a Committee of Enquiry into Animal and Vegetable Pests which a year later brought down its report. The Committee has recommended a number of major changes in weeds and vermin legislation for Queensland and there seem good prospects that many of its proposals will be adopted.

This leaves New South Wales with a legislative framework which has not had an overall review for many years and a system which appears to the outsider to be fragmented and non-cohesive, although some very good work has been done in some areas within this structure.

It is therefore singularly appropriate at this First Conference of the Council of Australian Weed Science Societies to review the events and outcome of the last 20 years and attempt to draw out those principles which make for efficient and effective legislation to ensure that objectionable plants are identified and categorized, and that appropriate things are then done about them.

WHY NOXIOUS WEEDS LEGISLATION?

As the Queensland Committee of Enquiry says, "We stress as our basic and considered belief that pest control or management starts and finishes with the landholder. If a plant is reducing the productivity of cropped or grazed land it is primarily for the landholder as a managerial decision to decide whether he takes steps to

keep it under control or is prepared to suffer increased costs or loss of productivity if he neglects it"(Anonymous, 1976a). Why, then do we need a set of laws to cabin and confine the landholder in respect of his legitimate management decisions about his own property?

As we all know, harmful plants are characterized by variation in the features which make them pests; by variation in their capacity to reproduce and spread under different conditions; and by variation in the feasibility of eradicating, containing, controlling or learning to live with particular infestations of particular species. We also all know that man, as farmer or grazier, is subject to much variation in motivation towards particular standards or practices in management of his property and to much variation in his ability to adopt and sustain particular management regimes.

Therefore, basically because all men will not or cannot motivate themselves to take the action the community deems appropriate and because the consequences of one person's action or inaction may be felt by others, to their detriment, we have noxious weeds laws.

Given these factors, a legally based framework must be erected to give effect to the desire of a community to take cohesive action to protect itself from the adverse effects of plants it has labelled "harmful" or "noxious" or "pests"; to affix that label to particular species; to say what shall be done about the thus identified pests; by whom; and what will happen if they don't? This law will also say who pays for the work done and it will spell out in some fashion what should be done about pest plants on public lands of one sort and another - roadsides, stock routes, council lands, government-owned lands and unoccupied lands.

The elements of a noxious weeds law then may be specified as:-

(1) a means of defining a noxious weed

(2) a means of prescribing what action shall be taken against noxious weeds, species by species, circumstances by circumstances

(3) the allocation of responsibility for weed control on private and/or public lands

(4) an enforcement machinery, with provisions to deal with issues at both the local level and with problems of wider significance, and

(5) a financial structure to ensure that the resources for effective action are provided on a continuing basis.

DEFINING A NOXIOUS WEED

An examination of current lists of proclaimed weeds will reveal examples of the fact that "often plants are declared noxious following social pressures ..... it is a measure of the social conscience that once the declaration is made public interest dies" (Anonymous, 1976a). We are all familiar with cases where plant species have been listed, perhaps years previously, and the noxious weeds authority either does nothing about control or goes through the motions of enforcement with token effort and no follow up. When this is combined with the effects of parish pump politics, the whole fabric of noxious weed control can be discredited.

There has been some re-thinking in recent years by agricultural scientists and ecologists on the criteria which should be made before a plant species is legally listed for attack.

The well known paper of Amor and Twentyman (1974) provides an excellent review of Australian weeds legislation as it was pre-1974 and suggests an approach to weeds legislation which takes account of ecological principles, the extent of infestations and the need to blend public opinion with the use of technology, a knowledge of weed species life history and ecology and a realistic assessment of the practicability of various courses of action. I do not need to summarize this paper but refer it to any who have not studied it in depth. It lays a firm scientific foundation for legally based weed control programs.

Another paper by plant ecologist Milton Moore (Moore, 1975) also merits study. He, like Amor and Twentyman, strongly differentiates between the actions, aimed at eradication, which chould be taken against newly invading undesirable species, involving limited areas, and containment actions against more widely established species in situations where they do actual harm.

We need, at this point, to distinguish between two broad categories of undesirable plant pests - what the South Australian legislation calls "agricultural pest plants" on the one hand and "community pest plants" on the other. An attempt to adhere to the philosophies enunciated by Amor and Twentyman and by Moore has been made by the South Australian Commission. It has aimed at an objective and realistic basis for the declaration of any particular plant as a weed. If landholders are to be compelled to spend money killing specific plants let us be sure that those plants really do cause or threaten loss of production or amenity and that cost/benefit ratios are favourable.

The Commission believed that some plants had been labelled "noxious weeds" for many years without anyone being certain such plants really deserve that label. Often there had been changes in land use patterns or farm management practices which may have altered the significance of a plant as a weed. In most cases no attempt had been made in the past to prove that by spending money on spray treatment, for instance, farmers would be better off financially in either the short or the long term. In some cases, it is so many years since the weed was first declared noxious that no-one could remember why it was so classified.

Much activity against declared weeds takes place on roadsides. The question must, therefore, be asked: How realistic is it to continue controlling a roadside weed at the expense of the adjoining landholder when the weed is incapable of invading his property (or anyone else's property for that matter) because of the normal farming practices inside the paddock? Cultivation and growing crops and pastures create an environment in which many weeds will not thrive although they may be prolific in the very different conditions found outside the paddock, on the roadside.

Another aspect to note is the change in stock movement methods, especially in southern Australia. The use of the "long paddock" as part of the normal pattern of droving stock has been largely replaced by motor transport in many regions. Roadside vegetation therefore assumes a different significance.

Against this background, the Commission has adopted the following criteria for classifying agricultural pest plants:-

(a) the plant is or could become a significant agricultural problem, and

(b) effective control measures are available at reasonable cost or, if the plant is a contaminant of saleable produce or matter, it can be effectively removed.

The definition of "significant agricultural problem" is of course the key to this approach. It is defined by the Commission as "any circumstance leading to a measurable loss to a primary producer, caused by stock loss or ill health, reduction of crop yield or forage production, or contamination of products resulting in quality reduction".

The emphasis in these criteria is on agricultural productivity. But, of course, many plants may be harmful to man in a variety of ways without having any significant economic effect on primary production. There are many examples of such weeds - allergenic plants like poison ivy or ragweed and invaders of native vegetation like African daisy or *Pinus radiata*. They will be of special significance to the managers of national parks, to native flora conservationists and to public health authorities.

The South Australian criteria for declaration of a species as a community pest plant are:-

(a) the plant adversely affects non-agricultural land or the community in some way, and

(b) effective control measures are available at reasonable cost.

These criteria are in their very nature much less specific than those for agricultural weeds. They are open to substantially different interpretation, depending on the point of view of the interpreter.

The Pest Plants Commission in South Australia is attempting to secure meaningful schedules of community pest plants through the work of a special advisory committee it has established under the chairmanship of a member of the Commission. This committee also has representation from academic botanists, conservation groups and native plant societies and the National Parks and Wildlife Service. Although operational for only about six months, it has made excellent progress in the closer definition of community pest plant criteria and the identification of acceptable control measures in differing situations.

Over-riding the classification of agricultural and community pest plants - what the Tasmanian legislation calls "secondary weeds" - is of course the hard core of serious weeds which either do not exist within a State's boundaries or which are present in such small quantity or limited distribution that eradication is an acceptable target. Such are designated "primary" or "noxious" or "declared plants, Category P1" or "declared plants, Category P2". The various acts lay a clear obligation to "search and destroy" and to impose a quarantine. It is noteworthy that the West Australian legislation

is the only enactment which specifically separates weeds in this most undesirable class into those to be prevented from entry (P1) and those to be eradicated (P2), having already evaded the quarantine defences.

This group of declared weeds will typically include the drug plants, the serious water weeds, and a range of agricultural pest plants, often with substantial capacity to contaminate produce. They will usually be proclaimed for the whole of the State concerned.

The stringency of requirements for categorization of these primary pest plants is not matched in the case of agricultural or community weeds. Very often they will not meet the objective criteria in all physical or biological or management situations. Paterson's curse or salvation Jane (*Echium plantagineum* or *E. lycopsis*) is a case in point. In the mixed farming lands of South Australia's mid-north it is not a significant agricultural problem unless the farmer grazes only cattle and runs no sheep; furthermore, its purple blaze on the hillsides in spring is a valuable tourism attraction and a source of pollen and nectar for the honey industry! In higher rainfall pasture country, however, it is a cause for great concern as a strong competitor with and to the detriment of more nutritious and palatable species. But even there, the studies of Piggin (1976) raise some interesting points for the weeds legislator to think about. He says: "Paterson's curse is similar to plants such as capeweed, erodium and barley grass which are not noxious weeds and, generally, cause few problems. Perhaps it would be more realistic to concentrate on developing management programs to live with Paterson's curse, and minimize any problems it may cause, rather than undertake expensive, short term, and often ineffective measures of control". When taken together with assessments of the plants' nutritive value as in the same range as subterranean clover, food for thought, indeed.

DEALING WITH NOXIOUS WEEDS

The concepts outlined in the previous section lead us on to the question of prescription of the measures to be taken to deal with declared noxious weeds. If we accept the tests of significant actual loss or potential loss to agricultural production or community amenity and the question of the availability of economic methods of weed control, we will need to provide for a wide range of acceptable measures. With primary weeds, especially where infestations are small and localized, the question of eradication is implicit. Costs of a higher order will be acceptable if eradication of a serious weed is adjudged feasible. Such costs will properly be a charge against the central authority, rather than the local.

The classification of declared plants under the West Australian legislation is particularly useful. Pest plants are declared in four categories, P1 to P4. P1 covers prevention of introduction of all declared plants into the State. In addition, weeds are declared in one of the remaining categories, as follows: P2 for plants which will be eradicated (e.g. skeleton weed); P3 for plants whose population will be reduced (e.g. saffron thistle in northern wheat belt areas); and P4 for plants which will be prevented from spreading (e.g. Paterson's curse in northern agricultural areas) (Anonymous, 1976b). The Agriculture and Related Resources Protection

Act thus categorizes weeds according to whether they are to be prevented, eradicated, controlled or contained. The Act provides for declaration of a species for the whole state down to smaller areas, ranging through regions and zones established under the Act to an individual property. The broad mechanism thus exists to specify appropriate measures in accordance with the circumstances and fine tuning of the weed control program, using ecological principles and differential cost/benefit assessments, is made possible.

There is a growing concern in Australian communities for what is commonly called "protection of the environment". This has brought in this country, as in others, a focus of attention on the use of herbicides. Concern over the adverse side-effects of defoliants used in the Vietnam war, questions of water pollution, cases of off-target damage to susceptible species, preferences for goods grown without "artificial" aids, and the escalating costs of herbicides have all helped engender significant community attitudes ranging from a preference for non-chemical weed control to an outright condemnation of all such techniques. So much so that environmental impact considerations are now facts of political and social concern - and rightly so.

In any event, the individual or organization charged with coping with a noxious weed problem ought to look assiduously for ecologically sound techniques. The use of competition, attention to the timeliness of cultural operations, the planning well in advance of seasonal weed control operations all have their place in low cost programs with enhanced prospects of providing permanent solutions or stable, acceptable levels of infestation.

The identification and proliferation of biological control agents captures the popular imagination. The investment costs of this work are very high, and prospects of success often severely limited by the need to screen potential agents for damage they may cause to crop and pasture species related to the target weed. The "Cactoblastis syndrome" is deeply ingrained in the media and the public mind. We must not allow hopes for repetitions of the skeleton weed success obscure our thinking about less spectacular, non-chemical methods of attack which our noxious weeds legislation should foster. The use of competitive and shading-out plantings, particularly of native species, as a means of roadside and wasteland weed control, should be actively pursued by all weed control authorities. There is an urgent need for research and development studies on the problems involved, especially the question of ensuring establishment, at low cost, of desirable species in the many different environments involved.

RESPONSIBILITY FOR WEED CONTROL

As enunciated earlier, the basic responsibility for weed control must lie with the landholder. Because of the variations of land tenure details "landholder" should have the widest possible interpretation so that legal loopholes for buckpassing are eliminated.

Although the landholder's is the basic responsibility, weed authorities need to be able to do certain things either to assist and support him or to cajole, use legal force and otherwise see that the

job gets done. There needs to be the capability of advising on herbicides, equipment, timing of operations, management plans and so on. There needs to be the capability of going in and doing the necessary work, efficiently and at the right time - either because the landholder prefers it that way or because he will not comply or is incapable of complying with a formal weeds order. In such circumstances the cost of the work done must be recoverable - either readily or, in the ultimate, through a charge on the land. The latter may be of special significance with small, non-commercial, rural holdings subject to absentee ownership. The authority should also have the flexibility to waive the whole or part of costs in particular circumstances where wider issues of protection are being served.

The responsibility of ownership and/or use ought quite clearly to extend beyond the private sector to all forms of government, whether local, state or national. It is interesting to note the different approaches in the several state laws. The West Australian legislation simply states (Section 39) that government departments and municipal councils must control declared plants on their land. The Victorian Act (Section 6(1)) lays on the Minister of Lands the duty "to take sufficient reasonable action to destroy and suppress all .... noxious weeds on and to keep clear and free of ... noxious weeds" in respect of unalieniated Crown lands, lands vested in the Minister and by agreement, the lands vested in various state authorities and municipalities, subject to some general exceptions. Tasmania places the onus on statutory bodies and local government (Section 3) or "the appropriate Minister" (Section 13). The South Australian Act (Section 7) describes the duty of the Crown as "to attempt with due diligence to achieve so far as is reasonably practicable (a) the destruction of all primary pest plants on that land; and (b) the control of agricultural and community pest plants on that land to the extent necessary to prevent their propagation onto neighbouring land". The Queensland Committee of Enquiry has recommended (Recommendation 28) that "The (proposed) new Act should bind the Crown and its instrumentalities who should shoulder the obligation of clearing noxious plants ... on land under their control to the same extent as private landholders and local Authorities".

There is a great need for genuine and effective effort by government instrumentalities to control noxious weeds on their land, especially insofar as spread onto neighbouring private lands is concerned. Failure by national parks' managements, railways, highway or water authorities to play their part can be extremely disruptive both in regard to the physical effectiveness of local programs and, equally important, motivation of the private landholder.

No state legislation can, of course, bind Commonwealth government agencies but, as a generality, local managers of these instrumentalities do their best to assist, particularly where there are well planned and executed district programs.

MACHINERY FOR WEED CONTROL

Given the responsibility of the individual landholder for weed control, together with the concern of a State government for weed problems which affect or are likely to affect substantial areas and the need to deal with those weeds which do not respect State boundaries, some framework or matrix is needed to integrate the

various elements. The approaches of the six States are varied. Victoria has a strong, well financed Vermin and Noxious Weeds Destruction Board, responsible to the Minister of Lands, controlling a large field staff located in some 140 districts covering the whole State, and with the largest weeds research unit in Australia. The Board has very great strength through its capacity to control a numerous, widely dispersed staff in pursuit of agreed State policies. These policies are influenced by the representations of a Central Advisory Council, chaired by the Minister and including the members of the Board and some seven persons appointed by the Minister to represent the various farming and grazing interests of the State.

The Act also provides for District Advisory Committees which liaise closely with the Board's Inspectors on matters of local policy and concern. The Board has recently sought to increase the effectiveness of these committees by ensuring closer and more regular contact with them (Anonymous, 1977).

Tasmania gives the centrol power to the Director of Agriculture but provides for the division of the State into three municipal regions - northern, north-western and southern - each served by a departmental regional officer. In each region, at least once a year, is held a weeds consultative meeting, representative of primary producer organizations, local authorities and the Department of Agriculture (and perhaps other relevant government departments). The department, as a matter of policy, may use its statutory powers to underpin a "Weed Control Area", based on the essentially voluntary grouping of up to 20 or so properties within natural boundaries and the adoption of an agreed, cohesive, continuing control and/or management plan.

In Western Australia, the State is divided into nine zones, each divided into regions. Each zone is served by a Zone Control Authority of six to nine memebers, at least one from each constituent region, and chaired by an officer of the Agricultural Protection Board (the central authority). The Zone Control Authorities have wide powers for the implementation of the Act in their zones, subject to the Protection Board which may amend a Zone Authority's decisions in the interests of the State as a whole (Anonymous, 1976b).

Each of the regions within a zone is served by a Regional Advisory Committee, representative of shire councils and producer organizations, but appointed by the Protection Board from lists of nominations. The Board services each committee with a secretary and by appointment of a chairman if one is not elected. The Regional Advisory Committee can advise and make recommendations to its Zone Authority and carry out such functions as are delegated by that Authority; these powers are all subject to the Protection Board (Anonymous, 1976b).

The Agricultural Protection Board is the central authority which has ultimate control over local authority membership and activity.

In South Australia, the concept is one of local pest plant control boards proclaimed in respect of local government areas. A board may be set up in relation to a single council area, but the preference is for boards covering the area of several compatible

councils, with each constituent council appointing an equal number of board members. A board is a statutory corporate body in its own right and provides the legal basis for employment of weeds officers, determining and supervising control programs in its area, and enforcing the provisions of the Pest Plants Act in respect of both public and private lands in its area. The boards are subject to the oversight of the Pest Plants Commission and are required to admit Commission members or officers to their meetings and to have formal Commission approval for weeds officer appointments, financial structures and proclamation of locally significant pest plants.

In New South Wales, the enforcement of noxious weed control is very much in the hands of shire councils and little power exists in any central location to significantly influence the level or nature of local authority. The Noxious Plants Advisory Committee exercises some co-ordinating functions but is not set up to be an agent for the development of effective widespread programs. The most efficient weed control activities in New South Wales have occurred where county councils have been established, bringing together several shires, enabling the provision of sufficient funds and motivation to begin and sustain effective programs.

It is noteworthy that the Queensland enquiry has recommended a new Vermin and Noxious Plants Control Authority of ten members representing the relevant state government agencies (three members), primary producers (five) and local government (two), with at least four ministerially appointed expert consultative committees. At the local level, the Committee of Enquiry has recommended retention of the shire council or existing local authority. It specifically recommended against the establishment of "regional boards" which it saw as an unnecessary fourth tier of government (Anonymous, 1976a). Provision for local advisory committees, on either a shire or other locality basis, or for a specific pest-related purpose, is also proposed. The Central Control Authority would have the power to require enforcement actions by local authorities, in default of their own initiative.

Thus, there are many different approaches to the same problem with Victoria and New South Wales at the extremes of the range. No doubt the circumstances of each state differ significantly, as do the needs for weed control. Attitudes and expectations at the local level will have developed over many years and will be influenced by fortuitous events of the past.

There is undoubtedly a need for close local involvement, tapping the resources of knowledge of local environments and concern for one's own bailiwick. But this must be set in a framework which allows wider concerns to be expressed and the inhibiting effects of microcosmic politics to be avoided. The right balance between the local and the wider issues needs constantly to be sought and this will undoubtedly depend on the availability of finance, of which more in the next section.

The other area of increasing concern is the matter of weed movement across state boundaries. The nation has had serious shocks in recent years to find that our external quarantine barriers have been breached, allowing the incursion of new pests and diseases of major concern - the oriental fruit fly-like insect pest and the blue tongue-like virus in the far north, along with the two new devastating pasture aphids and warehouse beetle which have affected more

southerly parts. These serious breaches also re-focus attention on our internal quarantine needs and capacities. Western Australia and Tasmania are relatively fortunate in this regard because of the existence of significant natural barriers which make the tasks of those states to protect themselves that much easier. The situation of southern Queensland, New South Wales, Victoria and South Australia, linked by the Murray, Darling and Cooper river systems and associated transport avenues, is vastly more complex and difficult. The capacity of governments effectively to deal with interstate quarantine issues is of course greatly hampered by the provisions of Section 92 of the Commonwealth Constitution and progress depends very much on interstate co-operation. For several years the central weed control agencies of New South Wales, Victoria and South Australia have been meeting biennially to develop co-operative measures and policies of value in limiting weed spread in the Murray Valley and from the western division of New South Wales. In the last year or so, these conferences have been supplemented by executive-type meetings at about six monthly intervals.

A highlight of interstate co-operation is undoubtedly the joint three state-Commonwealth funding of a major water hyacinth control project in the Gingham Water-course (New South Wales) to protect the Murray-Darling River system from invasion. The review and consequent strengthening of weed control arrangements in Queensland and New South Wales will make for even more effective liaison and concerted action in the interests of national programs of weed eradication, control or containment.

FINANCE

The organizational structures and machinery for reflecting responsibility are of no use unless resources are available to support appropriate levels of the kinds of activity which the administering authorities have determined. At the individual or corporate land-holder level, the provision of finance to undertake the required control work on the property or adjoining roadsides is for that land-holder. But he needs to be satisfied that what he is called upon to do is worthwhile. His preparedness to comply with district programs will fall away rapidly if the concept of those programs is not based on effective measures and acceptable cost/benefit ratios, albeit crudely determined.

Part of gaining acceptance of district weed control programs depends on adequate understanding of the significance of the problems being tackled - significance in terms of the economic or amenity damage, actual or potential. Knowledge of the most useful techniques needs to be gained - weed identification, use of herbicides and equipment, timing, modified cultural or grazing management practices. Both of these pre-requisites call for the provision in the local, district situation of a threshold level of weed control expertise. If that level - threshold both as to quantum and as to quality - is not reached, surveying of problems, planning of programs, gaining of a very substantial measure of willing land-holder support, follow up of specially difficult situations or recalcitrant individuals will all be likely to falter and the momentum necessary for effective weed destruction or control operations on any useful scale will not be attained or, if attained, will be lost.

This locally available expertise costs money - for

professional, or semi-professional skills, for transport and communication costs. Given these basic costs at a level which matches the needs on a district by district basis, the foundation of an effective organization to implement local and state noxious weeds policies has been laid.

The question of whether these resources are placed in a framework with management links running directly back to central authority, subject of course to local influence and advice, or in an adequate local management framework which is subject to influence and, in the final analysis, control from the centre is a matter for each state's decision making machinery to determine. Every state has a different approach and it would surprise if that were to change. The essential factor, however, is for the resources to be sufficient to enable the threshold of effectiveness to be maintained locally. The most centrally controlled schemes will lean heavily on the provision of funds from the State Treasury, as is the case in Victoria. New South Wales relies very substantially on local shire rating arrangements with flat rate State subsidies. The South Australian scheme involves local government contributions, up to 3% of each council's general rate revenue on rural land, supplemented by a fixed subsidy at a relatively low level (50% of council funding), with provision for discretionary additional subsidy to local boards, based on an assessment of the constituent councils' capacity to pay in relation to the magnitude and seriousness of the noxious weeds problems in the board's area. The objective is to ensure the threshold level of locally available, full time expertise.

CONCLUSIONS

The conclusions reached from this review of Australia's current noxious weed control scene are that the essentials of effective weed legislation comprise:-

(1) policies about the designation of pest species and prescribed methods of their control which recognize the ecological, economic and social facts of life

(2) machinery which has sufficient flexibility to allow the same species to be treated differentially in different geographical or economic situations

(3) an administrative structure which gives a strong sense of local participation and responsibility combined with sufficient central strength to secure adequate standards at the local level and to deal with widespread problems and matters of interstate concern

(4) a financial structure which provides sufficient able and qualified persons to operate at the local level, to ensure sound planning and implementation of control programs, and

(5) clear and enforceable statements of the ultimate responsibility of the landholder - private or public - for noxious weed control, with options available to local and central authorities to partially or wholly accept financial responsibility in some circumstances, e.g. where eradication is the aim.

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