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INDUSTRIAL HERBICIDE USE IN BRITISH COLUMBIA NOW AND IN THE FUTURE

- A USER'S PERSPECTIVE

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INDUSTRIAL HERBICIDE USE IN BRITISH COLUMBIA NOW AND IN THE FUTURE  
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1/ M. R. Gardner

ABSTRACT

The current situation regarding Industrial herbicide use in the Province of British Columbia is reviewed. It is suggested that the present situation is less than satisfactory, but can be improved. The scope of Industrial weed control is discussed and explained with examples. It is suggested that the five components which underlie herbicide programmes are Men, Methods, Machinery, Materials, and Money. Each of these headings is expanded and specific recommendations made to improve Industrial herbicide programmes.

order?  
↓  
Men  
Methods  
Materials  
Machinery  
Money

INTRODUCTION

Industrial weed control in the Province of British Columbia is a disgrace. Until the corporate users, government users, chemical industry, the government regulatory agencies, academia, and the commercial applicators make a concerted effort to adopt a co-ordinated, scientific and responsible approach to this herbicide use on the west coast, it will remain a disgrace.

1/ M. R. Gardner  
Environmental Advisor,  
B. C. Hydro & Power Authority.

*We have*  
Until <sup>clear,</sup> adequately funded programmes embracing applied research, field development, integrated vegetation management planning, intensive training, strict regulations and active policing, development of appropriate application equipment, accurate and comprehensive record-keeping, and rational public information, ~~are developed,~~ we can make no progress.

This broadside is not fired idly; the theme of this paper is to develop a constructive framework of needs in the field of industrial weed control based on four years of frustration - which some gallantly call experience.

The central responsibility for change is held by the Provincial government, and it cannot abdicate that responsibility by appointing a Royal Commission and presuming that the problem will then evaporate. It is my personal opinion that the appointment of the Royal Commission by the Department of Health was unsatisfactory, the handling of publicity and policy during the tenure of the Commission was unsatisfactory, and the Final Report is unsatisfactory. *direct* This is not to be taken as a criticism of the Commissioners, who worked hard with a very difficult situation, often in a hostile and emotional environment, and with a minimum of professional assistance from the pesticide field. In addition, irrelevant and non-constructive posturing of various special

*contained therein*  
Unfortunately, some of the recommendations are incomplete, inadequate, or incorrect.

(incorrect)

interest groups served <sup>only</sup> to distort and mask the pertinent issues, while experienced and concerned professionals with constructive ideas were subjected to rabbiid and unnecessary attacks.

However, our concern now is to move forward rationally with the wealth of <sup>relevant</sup> information provided by the Royal Commission Enquiry and the impetus created out of common concern. But to move forward we must have a minimum of political interference, ignorance and expediency, a change of attitude on the part of senior civil servants and corporate executives, and a clear commitment from individual professionals to the ~~principals~~ <sup>principle</sup> of product stewardship and prescription use, based on statistically supportable data gathered under B. C. conditions.

*Handwritten notes:*  
 People  
 Police  
 Justice  
 ↑

SCOPE OF INDUSTRIAL WEED CONTROL

Before dealing further with the separate alliterated headings under which I have chosen to discuss needs, it seems useful to develop a picture of Industrial weed control as it is perceived by this author. It is more usual to assess scope by identifying individual users rather than uses. However, it better serves my purpose to use the latter to illustrate that Industrial weed control is no less important than that in Agriculture. Yet Industrial vegetation control has

been and remains the poor boy in terms of professional development, but the star child when it comes to government regulation. The absurdity of this situation is revealed in the usage statistics prepared <sup>for</sup> by the Royal Commission Final Report, Volume II, Part II, Appendix MM. The responsibility for this situation would appear to rest jointly with the Department of Agriculture and the Pesticide producers, both of whom seem to have a vested interest in maintaining <sup>that</sup> the status quo. *As far as insecticide control goes*

The Canada Weed Committee Western Section cannot, however, be absolved of responsibility regarding the present situation since examination of Categories A & B shows almost no emphasis placed on assessing the broad range of new compounds and preparing detailed site specific recommendations for the industrial user.

The following then are suggested as the basic areas of Industrial weed control explained with a few examples.

(1) Health:

Suppression of allergenic plants, and control of vegetation which may support undesirable insect infestations, or populations, or provide cover and nesting for vermin.

(2) Fire Prevention:

The establishment and maintenance of fire breaks and the control of vegetation around tank farms, substations, gas or oil pipelines and regulator facilities, and around all types of wooden structure.

(3) Safety:

The control of vegetation around communication facilities, hazard warning signs, railway trackage, and vegetation which may attract animals or birds to roadsides or airport flight paths.

(4) Noxious and Undesirable Weed Control:

Controlling the growth of poisonous, infesting, *stinging,* or puncturing plants.

(5) Access:

The maintenance of roads and the preservation of open spaces around beacons, transmitters, ~~etc.~~, *and the like* from encroachment by undesirable plant species.

(6) Visibility:

The maintenance of clear sight lines for road, railway and airport facilities, and the removal or control of vegetation around facilities requiring maximum security.

(7) Damage Prevention:

The control of vegetation which will retain moisture around wood or metal structures and barriers, and the removal of vegetation around desirable plants which would otherwise provide concealment for vermin. Also the control of undesirable roots and stems of vegetation near buildings.

(8) Aesthetics:

The maintenance of weed-free landscaped areas and lawns and the total control of vegetation around storage or parking facilities.

(9) Pre Construction:

The use of non-selective chemicals to preclude regrowth after paving, gravelling, or concreting.

(10) Habitat Management:

The manipulation of successional development to retain species diversity and enhance production of food and cover for various wildlife species.

(11) Water Management:

The use of chemicals to maintain drainage and control undesirable aquatic growth.

(12) Site Preparation or Control:

The chemical manipulation of plant cover in order to establish or advance the growth of specified plant species by reducing competition.

Despite the diverse nature of the foregoing areas of use, I would suggest that a common thread of needs can be woven through each. The common theme is the necessity for judgement. The Industrial vegetation manager arrives at programme decisions using both established information and experience. Together these meld to form judgements on which will hinge the efficiency, efficacy, and environmental impact of a herbicide<sup>use</sup>. If the established information is inaccurate or incomplete, or experience the result of perception not written record, then the programme manager foresakes his professional, ethical, and social responsibilities.



The following then, is a discussion of needs presented under five headings suggested as the components which underlie programme management - the answers <sup>to these questions become</sup> ~~are~~ the tools by which the competent manager administers his tasks.

Men



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MEN

The most <sup>crucial</sup> ~~crucial~~ factors in any pesticide use are the personnel responsible for both planning and execution of the programme. It is not sufficient to train only the man with the hose <sup>or only the crew supervisor</sup>. Attitudes originate at the top of any organization - true even of the single human <sup>being</sup>. Attitudes crystalize from information. Education then <sup>is</sup> also a crucial factor in ensuring safe and efficient programmes - education at all levels of responsibility. At present we have no such diversity of programmed study in B.C. supported either by industry or by Government. The commitment of funds for training in British Columbia is totally inadequate and the standard of training absolutely minimal. That is not a reflection on Dr. Perrin but a recognition of the present attitude in the Department of Agriculture and the present restrictions on staff and minimal training aids.

There is no proper training manual for the individual Certificate categories, no time devoted to basic math required for rate calculation, and no practicum to determine work habits and ability to recognize target and non-target species. Teaching time also is severely limited by the attitude of employers who appear reluctant to release staff for appropriate <sup>terms</sup> ~~time~~. A revised Certification programme should establish different levels of competency. No individual should participate in any part of any Industrial weed control programme without at least a basic course and an ~~initial~~ <sup>provisional</sup> Certification.

Commercial <sup>a</sup> ~~Application~~ <sup>ors</sup> should be closely regulated as should Crown agencies. A proper field inspection team should be established. <sup>by the government</sup> More attention should be paid by the Worker's Compensation Board to industrial hygiene, particularly regarding protective clothing, or rather the lack of it. The chemical supply houses and pesticide manufacturers should make a conscious effort to Certificate their salesmen. This would show responsibility ~~\*~~ and leadership and improve the basic understanding of their products by their own staff who at times are sadly ignorant. An attempt should be made to assess other Provincial licensing or certification programmes with a view to ~~later~~ <sup>inter</sup> Provincial responsibility.

~~establishing~~      ~~responsibility~~

establishing inter-Provincial reciprocity.

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## METHODS

The individual users' methods are to some extent prescribed by the Provincial Act and regulations. A new ~~Act~~ is currently before the government for consideration. However, to my knowledge there has been no attempt to solicit suggestions from the industrial users regarding the regulations. An open forum for discussion <sup>could</sup> ~~can~~ be most useful in providing sound, workable, yet stringent regulations which could minimize the misuse of industrial herbicides. In this category ~~could~~ <sup>I would include</sup> be regulations concerning a more detailed schedule of control chemicals, regulated availability and storage of hazardous materials, comprehensive site inspection of proponents' proposed programmes and inspection of work in progress, field monitoring and sample collection for residue analysis, <sup>comprehensive records,</sup> and strict control <sup>on any</sup> of broadcast treatment with herbicides. Industrial users have a responsibility to prepare internal company regulations and detailed records <sup>on</sup> ~~of~~ the quantity, location, and disposal of herbicides. Examples of B. C. Hydro's documents in this area are attached for interest. Wherever possible, industrial users who have a recurring problem of vegetation control should prepare <sup>a</sup> prescription vegetation management plan which emphasises site specific treatments <sup>using</sup> ~~with~~ the most appropriate <sup>technique</sup>. Where herbicides are used, records should dovetail into long-term management profiles which provide historical data on past practices. Companies should <sup>also</sup> keep abreast of the most advanced techniques, an example being the use of infra red false colour photography to determine target areas and monitor control ~~methods.~~ <sup>effectiveness.</sup>

New para

Finally, large users should encourage public participation in the development of their programmes, and provide well-documented literature on the use, and reasons for use, of herbicides for vegetation control in their overall management programme.



MATERIALS

Applied

~~Present~~ research ~~programmes~~ to establish the efficacy, degradation, and environmental impact of the range of new selective and non-selective herbicides has not been undertaken on a consistent basis in British Columbia. In some cases development work carried out by chemical companies in conjunction with industrial users has not been followed up or has been undertaken using inadequate research protocol and <sup>statistical</sup> design.

Variability as a result of application, <sup>meteorological conditions,</sup> technique, season, soil type, target species, ambient <sup>temperature,</sup> formulations and rate, have not been adequately documented. Routes of entry into the environment, <sup>bio-types</sup> metabolism, degradation, and resistant ~~species~~ remain to be quantified for many chemicals. Little or no recent work has been carried out on the many drift control agents, stickers or adjuvants. Penetrating agents and translocation modifiers require further study, <sup>as do the</sup> ~~agents~~ <sup>variants</sup> of formulation and carrier in terms of both effectiveness and environmental impact. <sup>Further,</sup> It appears that

no concerted effort has been made to assess the potential of growth regulators to replace true herbicides in some industrial weed control programmes.

Narrow spectrum herbicides, product combinations, and chemical rotation should be investigated and encouraged where appropriate.

These comments...

~~Narrow spectrum herbicides, product combinations, and chemical rotation should be investigated and encouraged where appropriate.~~

new para

These comments should in no way be taken as a criticism of Eric Hughes, who has pursued with considerable difficulty and with what little time he could spare, a small programme of research into industrial herbicides. ~~It~~ Until the recommendations on structure for Provincial management of pesticides, as recommended by the Royal Commission, are enacted, it seems unlikely that research will be conducted in a comprehensive, co-ordinated, <sup>and</sup> efficient manner. I have advocated in the past, and I advocate again, the ~~formation~~ <sup>formation</sup> of ~~another~~ <sup>an inter-</sup> agency Research Committee charged with pursuing some of the points raised in this paper. Each agency concerned should contribute a fair and equitable proportion of funds to ensure that long term <sup>beneficial</sup> research projects can be carried through to fruition. For interest three ~~number~~ <sup>prepared by this author</sup> research proposals are attached as examples.

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MACHINERY

By comparison with development in Eastern Canada, design and testing of application equipment for B. C. conditions is woefully inadequate. Basic requirements for such equipment are that it minimizes drift whether application is liquid, pellet, or powder and that it maintains accurate delivery rates evenly at the target area. These premises are generally true irrespective of ground or air application, broadcast or spot treatment. Efficiency of equipment will be reflected in ability to traverse various terrain types with load capacity appropriate to programme size, except where equipment is developed explicitly for level ground application as in substations or on rail tracks. Equipment should be versatile, yet developed with its expected work clearly in mind. Demountable ~~application~~ units should be considered, allowing the prime mover to be adapted for a variety of purposes. Equipment must be safe. It should have no exposed drive chains or hazardous pressure systems, and it should be designed with as low a centre of gravity as possible. ~~For liquid carriers, tanks must be leakproof and baffled.~~ Finally, any equipment is only as efficient and safe as the owner wishes to maintain it.

*adequate operation*

If other parts of Canada can develop innovative equipment for their conditions, so can we for ours. At the very least we can inventory



other designs and assess the most promising under B. C.

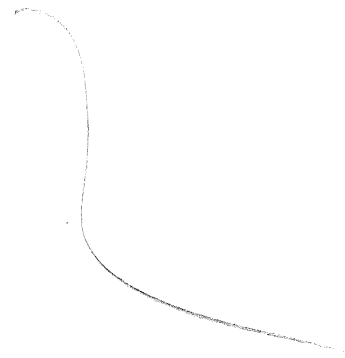
conditions. Examples are the Anchem ~~Helicopter~~ Micro Foil

Boom for <sup>helicopter</sup> aerial applications and fixed wing aircraft <sup>designs</sup> for

pellet application, various new nozzle designs for ground

application, and specialized pumps for invert emulsions.

~~insert~~



MONEY

Although much of what I have said is a question of attitude and organization, little if anything can be accomplished without adequate funding. I would suggest that the Provincial Government set aside a reasonable sum specifically earmarked for research, and that industrial users and Crown agencies contribute on an equitable basis. This fund could be supported by a tax levied by ~~weight on~~ <sup>weight on</sup> individual chemicals, by a charge for applicator Certification, and for each individual application for permit from the regulatory agency. Not only would this latter suggestion raise money, it might have the beneficial spin-off of improving the standard of applications for approval to apply herbicides!

<sup>also</sup>  
It may be worthwhile studying other innovative approaches from other Provinces, or States in the U.S., which provide funds for research and development.

~~Without a commitment to funding by all concerned to improve our collective knowledge, we but whistle in the wind to our own heart's~~

~~disappointment~~

~~Without a commitment to funding by all concerned to improve our collective knowledge, we but whistle in the wind to our own heart's disappointment.~~