DEPARTMENT OF AGRICULTURE, SOUTH AUSTRALIA

Agronomy Branch Report

SOME OBSERVATIONS ON WEED CONTROL IN CANADA

REPORT ON CANADIAN VISIT

C.R. Alcock,
Agronomist, Local Government
Weed Control.

Report No. 72

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INTRODUCTION:

During a private tour of Canada from 9th June to 18th August, 1975, Mr. Alcock was given 15 days study leave to assess weed problems encountered in Canada, together with methods of control.

The report is informative and considering the limited time available, quite comprehensive, and should prove to be of considerable interest to those involved in weed control in South Australia.

Interesting aspects of the report relate to the effective co-ordination achieved between Government authorities and industry, the criterion of declaring weeds noxious according to their economical importance to agricultural production and that selective control of annual or biennial weeds in crops is aimed at destroying the weed rather than suppression.

The section on biological control indicates that Canada is very active in pursuing this aspect of weed control and as some of these predators now under scrutiny appear to have application to similar problems in Australia, Mr. Alcock has recommended that the report be referred to the C.S.I.R.O.

Apart from the observations contained herein, additional literature and information covering various aspects of weed control in Central Canada are available on request from the author.

Mr. Alcock has suggested that if a similar study tour is permitted by the Department, personnel should be permitted to travel by air between main centres. This would allow more time for fruitful investigation and eliminatetime consuming and fatiguing bus travel.

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REPORT ON CANADIAN VISIT

1. PROVINCES & CENTRES VISITED & INVOLVEMENT:

Appendix 1 lists the names, titles and addresses of persons contacted during the Canadian visit.

1.1 Alberta Province

1.1.1 Edmonton & district

Alberta Department of Agriculture - Mr. W. (Bill) Lobay, Head of Weed Control Branch and supervisory and advisory staff.

Discussed - structure, work flow, responsibilities and administration of weed legislation. Also application of regulatory extension weed control procedures, field services and subsidies. Field inspections and visits to regional and municipal (council) offices working under the Agricultural Services Board. Enquiried into district services and work programmes implemented through municipal field supervisors.

1.1.2 Calgary & district

Alberta Department of Agriculture, Mr. D. MacKenzie, Acting Regional Plant Industry Supervisor.

Discussed - Agricultural Service Boards, finance and role of local governments.

Attended an Agricultural Service Board two day weed tour of the district to assess noxious weed treatments by councils and landholders.

1.2 Manitoba Province

1.2.1 Winnipeg

Manitoba Department of Agriculture, Mr. J.O. (Jack) Forbes, Chief of Weed Control.

Arranged for me to join a four day weed tour of research centres in Manitoba and Saskatchewan.

Main areas of discussion - role of herbicides, off-target damage, criteria and policies in declaring weeds.

On tour - inspection of trials at research centres at Carman, Elm River, Canberry and Brandon.

1.3 Saskatchewan Province

Tour continued. Inspections of research centres at White City, Regina, and Findlater and industrial trials near Regina.

1.3.1 Regina

The Canadian (Federal) Department of Agriculture has established the main research centre for weeds at Regina. Dr. J.R. Hays, Director.

Obtained specific details of research and weed species. Weeds/ plants, Mr. K.F. Best. Biological control, Dr. P. Harris. Other treatment, Dr. J.H. Hunter.

Saskatchewan Department of Agriculture, Mr. F.D. Leavitt, Weed Control Specialist, discussed and inspected various field problems.

2. GENERAL OBSERVATIONS & COMMENTS:

Quite a number of field problems in rural areas are common to both Canada and Australia, but there are some marked differences in measures adopted in attempting to provide adequate remedial services by the two countries.

Compared with Australian states, my impressions are that the Canadian concept is more progressive because sound co-ordination has been achieved at all levels between the authorities and industries concerned. It is a more streamlined approach to problem solving in rural districts.

The Federal Government of Canada is more closely involved than the Australian Government, not only through direct financial assistance to the Provinces but in providing and maintaining research centres and extension services throughout Canada.

Certainly in respect to weed control, Government and industry assistance appears to be substantially greater when compared with Australian counterparts and particularly in South Australia. It is possible that the combined and more unified approach to solving and servicing rural field problems throughout Canada has stimulated more confidence and increased financial backing.

In recent years some good progress has been made towards co-operation between the states of Australia, but we have a long way to go and many obstacles to overcome before reaching the standards currently operating in Canada.

3. RESEARCH & FIELD TRIALS:

With rare exception, all weed research and field trials are co-ordinated through the Canadian Government Research Centre, Regina, Saskatchewan. While the main enquiries are in respect to weed control and farm production, all aspects of weeds and associated problems are investigated.

Herbicide recommendations and other field control techniques are correlated with biological, ecological and other environment considerations. Biological or bio-control of weeds is an important area of research at the Regina Centre.

Research priorities, in keeping with regulatory, advisory and other co-ordinated areas of work, are based largely on the economic importance of each weed to agricultural production and the need to provide the most effective and practical field treatments.

This common objective is in contrast with the varying attitudes and approaches so often apparent between research, advisory and regulatory personnel engaged in weed control work, both throughout and within the states of Australia.

Many advanced trials are duplicated at the various centres and on private farms in order to observe results over a wide range of situations.

Computers are used extensively to corroborate field assessments.

3.1 Outline of Research Priorities

Field crops, especially cereals, oilseeds and legumes (beans and lentils) followed by pastures, rangelands, natural and other reserves and urban areas, are the situation priorities. Top priority is given to grassy weeds and the perennial broad leaf weeds with deep creeping rootstocks.

In order of priority these weeds are listed as follows:-

3.1.1 Annual grasses

Wild oats (Avena spp.), green foxtail (Setaria viridis), and Persian darnel (Lolium persicum).

3.1.2 Perennial grasses

Perennial grass with long rhizones - English couch or quack grass (Agropyron repens).

3.1.3 Perennial broad leaf weeds

Perennial broad leaf weeds with deep creeping rootstocks:- Canada or perennial thistle (Cirsium arvense), bladder campion (Silene vulgaris), field bindweed (Convolvulus arvense), Russian knapweed (Centaurea repens), perennial sow thistle (Sonchus arvense) and leafy spurge (Euphorbia esula).

3.1.4 Annual or biennial broad leaf weeds

Such as wild radish (Raphanus raphanistrum), wild mustards (Sisymbrium spp.), ball mustard (Neslia paniculata), charlocks (Sinapis spp.) and other crucifers.

Red root-pig weeds (Amaranthus spp.), fat hen (Chenopodium album), cow cockles, catch fly (Silene spp.) and related species, Russian thistle (Salsola kali), dandelion (Taraxacum offinale), Hawke's beards (Crepis spp.), sow thistles (Sonchus spp.), slender thistles (Carduus spp.), spear thistles (Cirsium vulgare) and other daisy or thistle weeds of the composite family.

4. HERBICIDES:

The list of herbicides registered in Canada is similar to those available in Australia, but there are differences in some formulations which are designed to meet specific needs of each country. Herbicide testing in Canada appears to be extensive and intensive.

In addition to investigations into formulations, mixtures, rates, timing, residues, application and various techniques, trials are combined with the use of fertilisers, crop rotations, tillage, slashing and other farm practices.

A summary of the more recently developed herbicides, weed problems and situations applicable to the agricultural areas of southern Australia are as follows:-

4.1 Wild Oats & Annual Grass Trials

In addition to Avadex, Carbyne, Avenge and Barban, several new herbicides are under trial:-

* HOE - 23408 - Applied at 1.2 kg a.i. per ha at the two leaf growth stage (weed) is giving most outstanding results. The herbicide prevents development of roots and has some soil residual characteristics. Trials are being conducted mainly in wheat, barley, rape, flax and broad beans.
* DOWCO - 356, 367 & 390 - Limited trials in wheat have given variable results, but it appears to be more effective when included in mixtures to control broad leaf and grassy weeds.
* PROWL - Trials put down in wheat, barley, rape, flax and broad beans.
* COBEX, CGA - 1082 & CGA - 4143 - Trials put down in wheat, barley and rape.
* CP - 53619 - Trials put down in wheat and barley.
* RH - 5205 & RH - 2915 - Trials put down in barley.

4.2 Broad Leaf Weed Trials

* ASULOX F - Trials put down in flax (linseed).
* SENCOR - Trials in wheat and broad beans.
* M - 3785 & M - 3786 - Trials put down in wheat, oats and barley.

Note: Details of the numerous trial plots with some computer print-outs on intermediate assessment of results are available from the writer.

5. BIOLOGICAL CONTROL:

At the Regina Research Centre the Biological Weed Control Section, headed by Dr. Peter Harris, is investigating predators in respect to some 26 weeds. As indicated below, a number of these weeds and their bio-control agents are of direct interest to this State and Australia generally.

* Creeping knapweed (Centaurea repens) - A gall nematode (Paranguina picridis), is in the advanced screening stage. Will also attack other perennial or biennial thistles (Centaurea, Carduus and possibly Cynara spp.).
* Perennial or Canada thistle (Cirsium arvense). A leaf beetle (Altica carduorum), a root beetle (Ceutorhychus litura) and a stem gall fly (Urophora cardui), have been released in several provinces and results are currently being assessed.

* Spear thistle (Cirsium vulgare). A seed head fly (Urophora stylata) has been released in British Columbia and appears to be effective and specific. Seed heads become swollen and woody and maggots of the fly replace the ovules or achenes.

* Leafy spurge (Euphorbia esula and E. cyparissias). A defoliating moth (Hylas euphorbiae) established in Ontario, a root moth (Chamaesphecia empiformis) released in Saskatchewan, and a root beetle (Obera erycephala) is being screened. As we have similar weed species, particularly false caper (E. terracina), and it is possible that these predators may have application under Australian conditions.

* St. John's wart (Hypericum perforatum). Defoliating beetles (Chrysolina hyperici, C. quadrigemina and C. varians), have been released with some success. The latter, C. varians, is effective in higher rainfall areas from 750 to 1000 mm per annum.

  Dr. Harris suggested that the parent stocks of the insects, when introduced into Australia in the 1930's, were most likely infected with a debilitating disease which resulted in a loss of predatory vigour.

  A root beetle (Agrilus hyperici), a defoliating moth (Anaitis plagiata) and a leaf gall fly (Zeuxidiplosis giardi) have been released also, but not yet established.

* Russian thistle (Salsola kali var. tenuifolia), a variety similar to our buck-bush (S. kali). A stem boring moth (Coleophora parthenica) has been released in Saskatchewan (also in California, U.S.A.) this year.

* Perennial ragwart (Senecio jacobaea). A defoliating moth (Tyria jacobaeae) and a root beetle (Longitarus jacobaeae) have been released but are slow in establishing.

* Nodding thistle (Carduus nutans). Seedhead beetles (Rhinocyllus conicus and Ceutorhynchus horridus) have been released and established in several provinces.

  Possible use in Australia against slender thistles (Carduus spp.).

* Bladder campion (Silene vulgaris) - surveys for suitable predators taking place in Europe.

* Dwarf prickly pears (Opuntia spp.). Surveys in Argentina produced a moth (Melitara prodenialis) for screening.

5.1 Recommendation

In view of the possible adaption of these bio-control agents to similar or closely related weed species in Australia, it is recommended that direct enquiries be made to the C.S.I.R.O. for further information and possible early introduction of predators for screening and trials.

6. FIELD OBSERVATIONS:

6.1 Use of Herbicides

Inspections of herbicide treated areas indicated generally that in Canada herbicides give a more consistent result when compared with similar rates of application in this State.

Undoubtedly this is due to the spring-summer cropping period in Canada where rising temperatures (from warm to moderate) with ample soil moisture is more conducive to early establishment and growth of plants when compared with the winter-spring cropping period in southern Australia. Our cold winters tend to restrain early establishment of field crops and favours the growth of competitive winter weeds. In addition, later development may be restricted by lack of soil moisture and finally growth is terminated by hot dry summer conditions.

In selective crop spraying for annual or biennial weeds, the aim is to destroy rather than suppress the target weeds. Suppression spraying is only adopted for the control of the deep rooted perennial weeds because of the need to consider crop tolerances to the herbicides used.

In discussions with field officers, I found only one who appreciated our concept of economic suppression of crop weeds. This relates to the aims and adopted policies under the Canadian weeds legislation. Close co-operation between research, extension and field officers, whether advisory or regulatory duties, have similar attitudes and approaches to problem weeds. They are concerned with more than temporary control and are looking for long term control or eradication. That is, where practical, the aims are for more permanent suppression and replacement of undesirable plants.

Canadian Departmental officers are worried by the development of light weight, self-propelled spray units, designed to travel up to 15 k.p.m. and apply less than 50 litres per hectare. Field observations indicate inconsistent results and there has been a marked rise in complaints from farmers where contractors have employed these machines on crop spraying.

By contrast, the Departmental officers claim that uncompleted trials tend to show that in many situations, including field crops, more efficient use of herbicides may be obtained by using higher volumes of water, that is, in excess of 100 litres per hectare.

Except in Alberta, a determined effort is made to discourage the use of ester forms of 2,4-D. This is not only in consideration of pasture legumes and field crops, but as a general environmental protective measure.

The rural communities in Canada are far more aware of the practical value of trees and shrubs than their counterparts in this country. This has arisen from the necessity to have protective barriers against the bleak winter winds and to control snow drift. Much money and effort has been expended over many years on tree planting programmes to provide shelter belts because in its original state the open plains of the prairies were almost devoid of trees.

Another reason for the Canadian to be well aware of off-target problems is that compared with this State, farming is more intensive, individual cropping areas are smaller and a wider variety of field crops are cultivated.

7. WEED PROBLEMS:

7.1 Similar or Related Weeds Common to Both Countries

A comparison of similar or related weeds occurring in South Australia show that perennial weeds, especially those with deep creeping rootstocks, vary little with those found in Canada. Most notable exception being skeleton weed. The species commonly encountered in Canada was small, pink flowered and insignificant; Lygodesmia juncea.

A number of the problem weeds of cereal areas of Canada also occur in this State, either as insignificant weeds of agriculture or as problems of specialised situations, such as under irrigation and urban development.

Weeds of similar appearance and occupying similar ecological roles but of different genera or species were also noted.

No doubt, given the chance, a number of the Canadian weeds which do not occur in this country could become problems here, particularly the crucifers (mustard-turnip) weeds or composites (daisy-thistle) weeds of cereal growing areas, as set out below.

7.2 Weeds & Situations of Canada Compared with South Australia

7.2.1 Perennials

* Canada or perennial thistle (Cirsium arvense). Widely established and major problem in Canada. Minor and limited outbreaks in South Australia. High priority for control/eradication in both countries. Canada basic treatment, non-selective, 1 kg a.i. picloram/ha or 2 kg a.i. dicamba/ha.
* Bladder campion (Silene vulgaris). As with South Australia, minor outbreaks only but spreading. Given high priority for control/eradication. Canada basic treatment 2 kg a.i. fenoprop/ha at 2-4 leaf stage.
* Field bindweed (Convolvulus arvensis). A well established crop and field problem in Canada (and U.S.A.), and is given high priority for control. In South Australia, few problems in cereal regions but well established in horticultural and urban areas. Canada, basic treatment 2 kg a.i. picloram/ha.
* Hoary cress (Cardaria draba). Similar to South Australia, distribution appears to be limited to certain areas but well entrenched. Priority for control and several outbreaks inspected had all been treated with Fenac-2,4-D, 0.5 kg per $10m^2$ or about 250 kg/ha.
* Povery weed (Iva axillaris). Indigenous to Canada, has proven aggressive on heavy alkaline soils. Control priority is low whereas in South Australia has top priority as it is a rare plant. Sodium chlorate used with variable results.

* Russian knapweed (Centaurea repens). Distribution similar to South Australia. Many small outbreaks with several large problem areas. Has a high priority for control and eradication. Basic treatment, 1 kg a.i. picloram in 1 kl water per ha.

* Leafy spurge (Euphorbia esula). Closely resembles false caper (E. terracina), both in appearance and problem situation. Has a high priority for control in Canada. Basic treatment, 2 kg a.i. picloram in 1 kl of water per ha.

* Dwarf prickly pear (Opuntia spp.) In Canada these dwarf native species are particularly obnoxious plants due to the numerous sharp spines which can cause lameness. The spiny pats up to about 25 cm high, become hidden in long grass.

While we usually associate cacti with hot dry conditions, it is well to remember that this group of plants range naturally throughout America and Canada.

It is possible that some cacti introduced as ornamentals from temperate climates may well escape and add to the problems caused by prickly pear in Australia.

7.2.2 Annual/biennial weeds

* Wild oats (Avena spp.). Number one noxious weed and top priority in treatment and research. Well established, common problem, much more so than in South Australia. Current control - selective herbicides Avadex BW, Endaven, Carbyne, Avenge, Treflan and Asulox, depending on the field crop. HOE 23408 trials most promising.

* Ryegrass (Lolium spp.). Darnel is the main species and is comparable with the Wimmera ryegrass problem in South Australia. Darnel is given high priority for control. HOE 23408 and treflan trials appear to be effective.

* Brome grasses (Bromus spp.), as with South Australia a number of species involved. Downy brome (B. tectorum) causing similar competition and stock problems as sterile brome (B. diandrus) in South Australia. Has low priority for control.

* Cleavers (Galium aparine), as in South Australia, problems occur in the more favoured areas and is not proclaimed. Has a low priority for control. Basic control, 0.75 kg a.i. Buctril M per ha at early seedling stage.

* Wild radish (Raphanus raphanistrum). Wild mustards and related crucifers. As in South Australia there are a number of weedy species from this family which compete with and contaminate field crops. In Canada most are proclaimed and have a high priority for control.

* Thistles, slender (Carduus spp.), spear (Cirsium spp) and related thistles causing similar problems as in South Australia. Most are declared and rate high priority for control or eradication.

* Dandelion (Taraxacum officinale), hawke's beard (Crepis spp.) and several dandelion or daisy-like weeds closely related to species occurring in South Australia. Unlike South Australia where such weeds are problems of urban or special areas, in Canada dandelion, hawke's beard and sow thistles are serious crop weeds with high priority for control.

* Russian thistle (Salsola pestifer or S. kali var. tenuifolia). Almost identical with buck-bush (S. kali), a common weed in the drier regions of South Australia and it may cause some problems following summer-autumn rains, but seldom in cereal crops. In Canada it is a serious crop weed and is given priority for control.

7.2.3 Other weeds common to both countries

Important to this State but of little significance in Canada:-

* Wire or door weed (Polygonum aviculare)
* Barley grasses (Hordeum spp.)
* Wild geraniums (Erodium spp.)

Important in field crops of Canada but of little significance in dryland farming regions of southern Australia:-

* Fat hen (Chenopodium album)
* Redroot pigweed (Amaranthus spp.)
* Barnyard grass (Echinochloa crus-galli)
* Ball mustard (Neslia paniculata)
* Charlock (Sinapis arvensis)

8. PROCLAIMED WEEDS:

Canadian weeds legislation is designed mainly as an agricultural act but considerations are also given to demands of health, aesthetic and other community aspects.

The main criterion in declaring noxious weeds throughout Canada is the economic importance of the weed to the agricultural industry and the highest priority is given to those weeds most detrimental to rural production, marketing and manufacture. Wild oats and Canada thistle, for example, are given top priority as noxious weeds although both are well established and distributed over the agricultural lands of Canada.

Priority ratings are determined at the time of declaring a weed noxious and co-ordinated services are set into motion by the authorities involved with the aim to remove or reduce the effects of the weed.

Research teams work in co-operation with extension, regulatory and other personnel to find and promote the most practical treatment techniques.

Government departments provide educational and publicity kits and their extension officers assist councils, field officers, farmers and other authorities on technical issues. Regional co-ordinators approve programmes and ensure resources are available to carry out weed control works.

Each person involved has a clear role, consistent objective and support at all levels.

9. ADMINISTRATION - WEEDS & OTHER LEGISLATION:

Local government councils in Canada are termed municipalities and designated as either urban or rural. The latter are broadly equivalent to our district councils.

Structure of Weeds Act administration and services flow charts are set out in Appendix 3 (1) and (2).

Noxious weed legislation is only one of many acts administered through the municipal councils assisted by Provincial (State) Boards, Departmental officers and other authorities.

Some of the rural services provided by the municipalities are the control of weeds, vermin, insects, diseases, drainage, snow drift, soil conservation and fire control.

To implement these services, municipalities employ a team of field operators. The team under a field supervisor are two or more field men and several spray or other plant operators. Their basic duties are field work, farmer contact, supervising and implementing works and special projects such as tree planting and grasshopper control.

Level of training is limited as both the municipalities and field men are expected to rely on the Departmental officers, such as district agronomists and regional co-ordinators for technical advice.

The regional co-ordinators are responsible for approving district programmes, allotting subsidies and other finance and ensuring sufficient resources are available to complete the programmed works effectively. In any one council area there may be upwards of 10 programmes to co-ordinate in addition to weed control.

Backed by consistent firm policies, sound forward planning and effective technical or practical assistance, the municipal field officers in Canada work with greater confidence and efficiency than our council weeds officers.

This is not a matter so much of the field man's ability, but rather an issue of resources backing and consistency of objectives.

Departmental officers servicing the council field officers in Canada claim that they are seldom required to arbitrate on enforcement issues between the field officers and the landholders.

Farmers and other landholders in Canada generally appreciated that weed control and other field services which are legally required to be administered through local government authorities are designed and implemented in the interests of the primary producer. For this reason, even with enforcement works, there appears to be much more tolerance and acceptance than in this country.

In the matter of noxious weed control in the field, every effort is made to encourage farmers to apply effective treatments. Promotion is in the form of tactical advertising, hand bills, demonstrations and personal contact. In some instances subsidies or other financial assistance is offered.

Because of the consistent approach there is little confusion in respect to weed control responsibilities, policies and procedures. Landholders are not confronted by differences in attitudes between regulatory and advisory officers.

Naturally there are some dissenters in the community who for one reason or another fail to make reasonable attempts to control proclaimed weeds and it becomes necessary to serve weed control notices on the offending parties.

In Canada, field men have wider powers to enforce the treatments of weeds than council weeds officers in this State. The Canadian council field officers have the authority to sign and serve weed control notices directly to landholders without referring the circumstances to the municipal council. But in practice, he confers with the district agronomist prior to issuing a notice to ensure that such action is reasonable and warranted and the correct legal action is being followed.

Also the field men have some restrictions which limit their authority in the serving of notices. These limits are based mainly on costs per hectare and are as follows:-

* In rural areas, cost per 65 hectares ($\frac{1}{4}$ square mile) should not exceed $300 for deep rooted perennial weeds and $200 for other noxious weeds.
* In the case of notices to prohibit the seeding of land, the field man is required to obtain council permission to issue such notices where the area under the notice is 5 hectares or more.
* In town and urban areas, cost shall not exceed $120 per hectare for land not subdivided into lots.

There are four basic weed control notices and in addition to the details set out below, the notice formats are shown in Appendix 3.

9.1 Noxious Weed Report

This is an advice notice which is sent to landholders and it has two functions:-

* A request to treat noxious weeds and is usually in the form of an agreement.
* A job sheet, detailing time, nature, cost and other details of work carried out.

9.2 Notice to Destroy Noxious Weeds

Similar to our council notice to destroy proclaimed weeds. It is addressed to the owner or occupier and states problem, location, action required, time of compliance and a warning against non-compliance. Only five days "right of appeal" is allowed and the weeds officer is authorised to do the work and charge costs to the person concerned without any further reference or direction from his council.

9.3 Notice to Prohibit Seeding of Land

Notice is addressed to land[illegible]der and states the problem, location and action required and prohibits seeding (sowing) of land until rescinded by a further notice. Land under this notice is usually fallowed with intense workings to reduce the weed problems. Herbicides may also be used.

9.4 Consent to Rescind "Notice to Prohibit Seeding"

This is an official notice which cancels a previous notice prohibiting the seeding of land. It is offered when the field man is satisfied that effective work has been carried out as described.

Regarding quarantine issues, the Canadian field officers have wide powers to hold, detain, and take action to cleanse or remove noxious weed infected stock, produce, vehicles, implements and other things or matter. Again, it is one of the functions of the district agronomist to ensure that field officers use their authority with discretion.

The legislation is essentially the same as that set down in our Weeds Act, but in Canada because of firm and consistent policies, producers and other persons involved take precautions to avoid the spread of serious weeds in the transport of stock and other produce.

9.5 Subsidies to Municipalities

In addition to the extensive research and extension services provided by the various Government departments, direct financial assistance in the form of subsidies or grants are available to municipal councils.

The subsidy entitlements cover field officers' salaries, roadside works, specialised equipment and various projects in addition to weed control services.

A 50 per cent subsidy may be claimed on the salary paid to a field officer and travelling expenses for special projects, as decided by the co-ordinating authorities.

As in this State, the municipal councils are responsible for the control of noxious weeds on roadsides but in Canada costs are not recovered directly from the adjoining landholders. The Canadian councils may claim 60 per cent of the costs from Government funds and the remaining 40 per cent is paid out of general council taxation (rate) revenue.

There are a number of subsidies or grants available for approved works on special projects in addition to weed control. Purchase of specialised equipment, chemicals, seeds, trees and other items for use on the special projects are subsidised. Some of these projects are land reclamation, drainage channels, tree planting for windbreaks and control of vermin, pests and diseases. Subsidy entitlements are available only on co-ordinated pre-planned projects and individual council programmes are required to be approved prior to implementing the field work.

The total running costs of the Alberta Agricultural Service Board during 1974-75 in servicing municipal councils (urban and rural) throughout the Province, was just over $5,000,000 and this figure does not include the cost of Government research.

The costs are apportioned as $2.2M. or 44 per cent to the Department of Agriculture, municipal councils $1.7M. or 33.5 per cent and farmers with other landholders $1.1M. or 22.5%. Actual expenditure on weed control through the Agricultural Service Boards was $625,000 or 12.5 per cent. This figure is comparable with the estimated cost of weed control services in South Australia through regional weed control boards under the proposed Pest Plants Act.

10. CONCLUSIONS:

Canada has not found the answers to all the diverse issues involved in effecting field control of weeds and other community problems, but it does appear that they are overcoming many of the adverse influences which retard progressive field work and efficient use of resources.

Particularly in regard to weed control legislation, there are few basic differences between the Weeds Act of both Canada and this State. However, there are some marked variations in concepts, policies and work procedures.

The most significant difference and influence on other policies and planning in Canada is that priorities for work on field problems is related directly to economic production. As a result, research, extension, regulatory, industrial and other interests cooperate to achieve common objectives. Control techniques therefore, have a wide acceptance by producers and other workers in the field.

Each person appears confident and aware of his responsibilities, particularly at district and council level. The status or identity of each person, branch or office is strengthened by unity of purpose and they complement each other rather than compete.

The Australian Weeds Committee, Government departments and other administrative bodies endeavouring to co-ordinate problem solving and field services throughout Australia would be well advised to investigate the Canadian approach to field problems to determine the possible adaption of similar methods to this country.

Because of the anticipated introduction of new legislation, the Pest Plants Act, it is recommended that in South Australia the Canadian concept in weed control and organisation of field services be studied in more detail so that applicable policies and procedures may be considered for adoption by the Pest Plants Commission.

APPENDIX 1

Main Contacts

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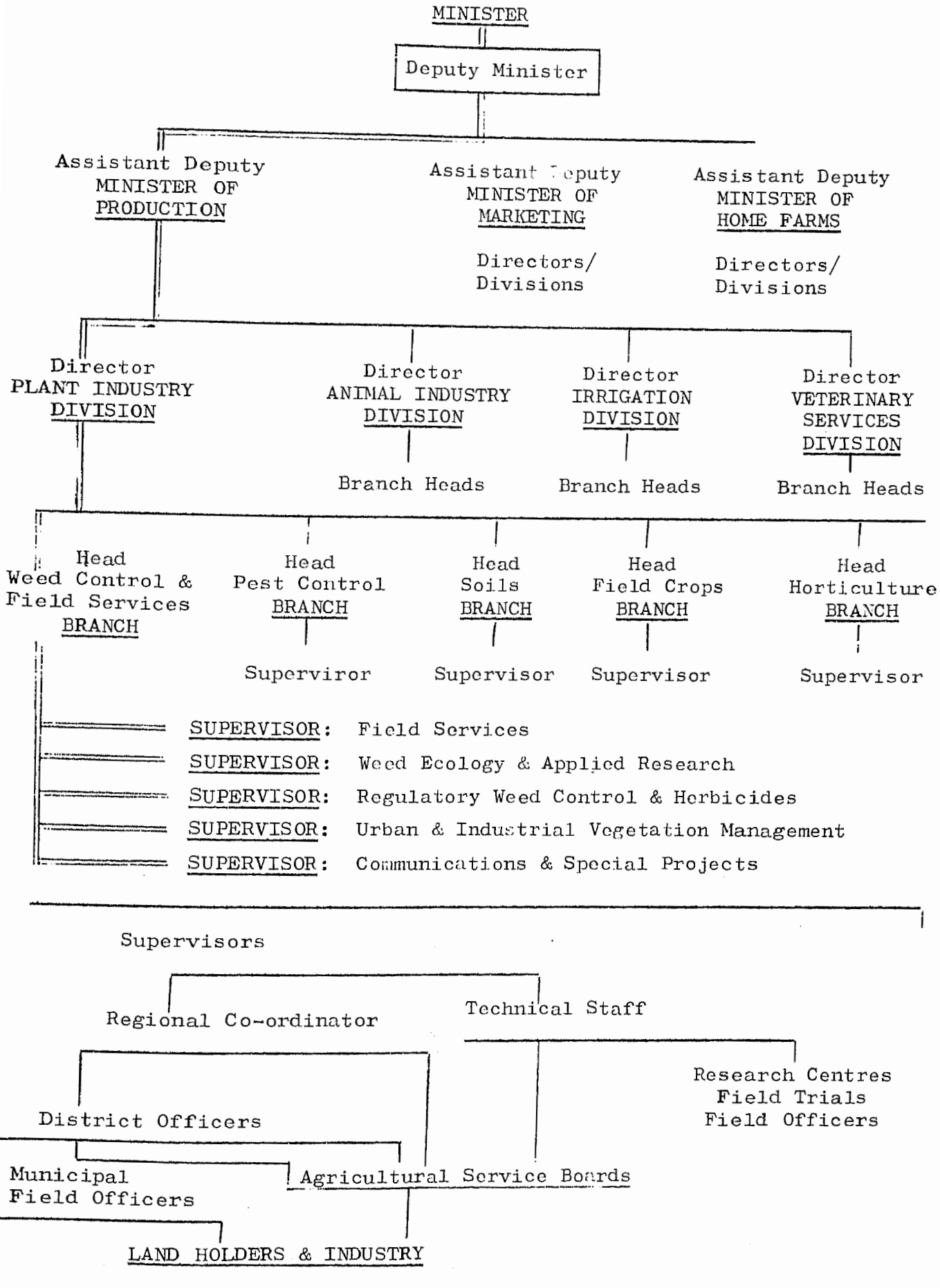
Manitoba.

Weed Control in Horticultural Crops

Note: Mr. Jim Lapka, formerly Chief of Weed Control, Brandon hasmoved to an eastern Province.

APPENDIX 2

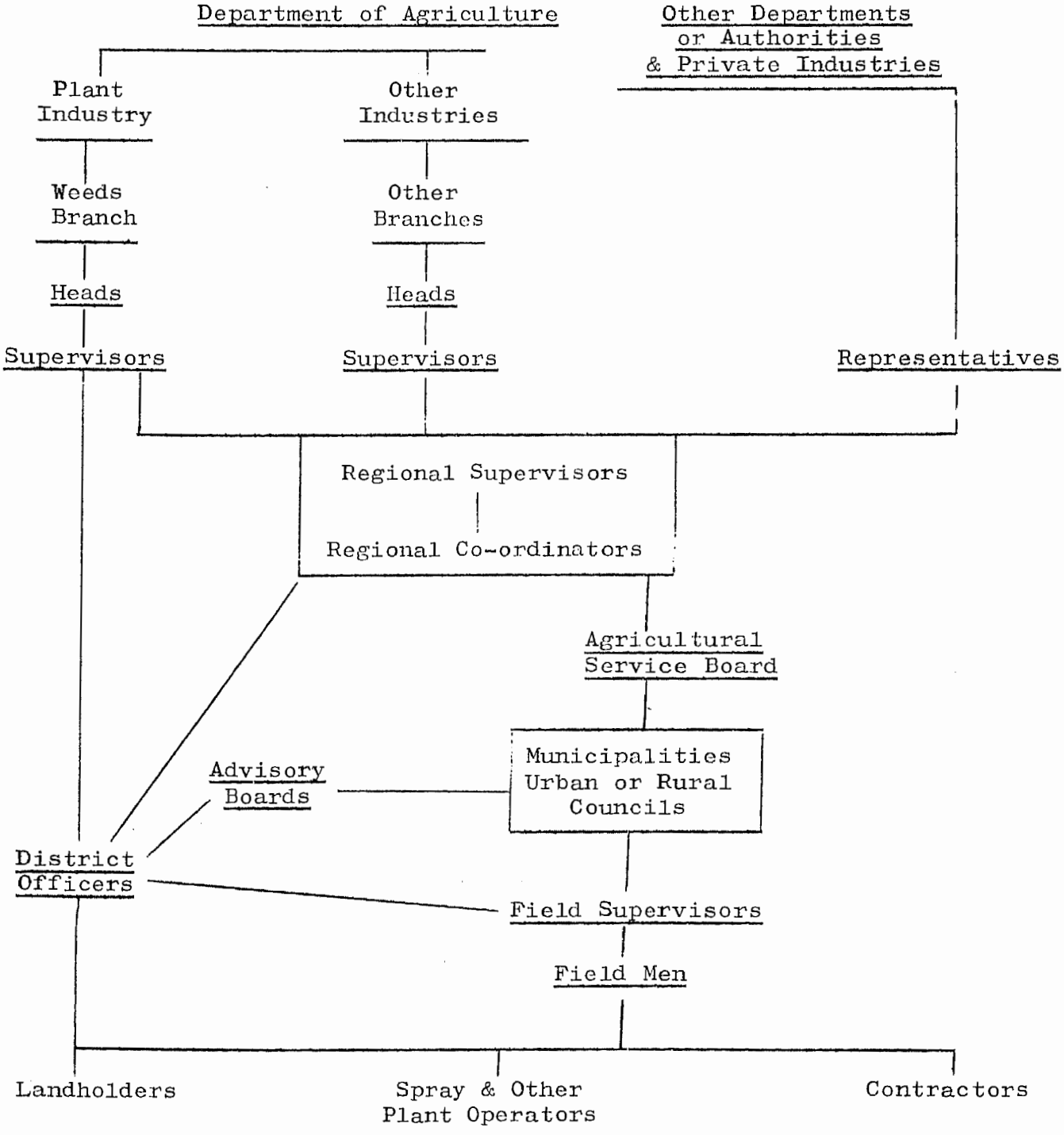
STRUCTURE OF ALBERTA DEPARTMENT OF AGRICULTURE



Appendix 2 (Contd.)

Flow Chart:-

WEED CONTROL & OTHER SERVICES



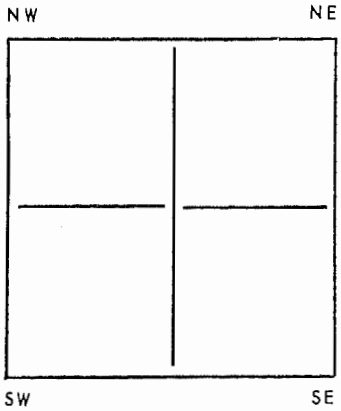
APPENDIX 3

NOXIOUS WEED REPORT

COUNTY OF LEDUC No. 25

Part of Sec.	Sec.	Twp.	Rge.	W. Mer.

APPROXIMATE WEED LOCATION MARKED xxx



NOXIOUS WEEDS

Class "A" Weeds

.....
.....
.....
.....
.....
.....
.....
.....

Name .....

Address .....

Date of Inspection .....

Weed Problem: (Weeds, Extent, Acreage, Crop, Etc.)

.....
.....
.....
.....
.....

Recommendations: (To farmer or others)

.....
.....
.....
.....
.....

Sprayer .....

Land Owner's Signature .....

Weed Inspector's Signature .....

APPENDIX 3

COUNTY OF LEDUC No. 25

Notice To Destroy Noxious Weeds

To ..... Address ..... Alberta

You are hereby notified that approximately ..... acres on

the ..... quarter of Section ..... Township ..... Range .....

West of the ..... Meridian, as indicated on diagram are infested with

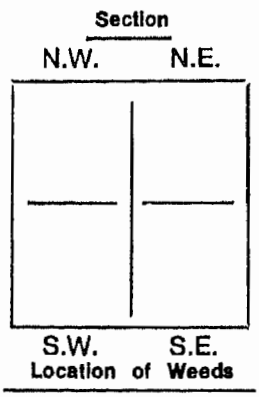
....

.....

which are declared noxious weeds under "The Weed Control Act", and

you are hereby directed to destroy the said weeds on or before .....

day of ..... 19.....



The weeds will be considered to be satisfactorily destroyed if .....

.....

or destroyed by any other effective method.

If this notice is not complied with action will be taken in accordance with the provisions of "The Weed Control Act".

Date ..... 19..... .....
Inspector.

.....
Address.

Issued under authority of Section 15 of "The Weed Control Act".

APPENDIX 3

Notice to Destroy Noxious Weeds (Contd.)

Appeals

Appeal to council

38. Any person

(a) who has an interest as owner or occupant of land,

(b) who is affected by any action taken or notice given by an inspector, and

(c) who thinks himself aggrieved by the action or notice,

may appeal to the council of the local authority which shall hear and determine, or shall by resolution appoint a committee to hear and determine, the appeal.

Notice of appeal

39. (1) Every notice of appeal shall be in writing and shall set out

(a) the name and address of the appellant,

(b) the description of the notice or action from which the appeal is being taken,

(c) the legal description of the land affected, and

(d) the grounds for appeal.

and shall be mailed or delivered to the municipal secretary

(e) in the case of an appeal from a notice, within the time specified in the notice for taking any action or within 15 days, whichever is less, or

(f) in the case of an appeal from any action taken by an inspector, within 15 days of such action being taken.

(2) The notice of an appeal shall be accompanied by a deposit in the sum of $10 which shall be returned to the appellant if the appeal is allowed but shall otherwise be forfeited and becomes the property of the local authority.

(3) The municipal secretary shall forthwith upon the determination of the appeal forward a copy of the decision and the reasons therefor, if any, by mail to the appellant at his address shown on the notice of appeal and to the inspector.

Offences and Penalties

Offence and penalty

42. Any person who contravenes any of the provisions of this Act or the regulations or of any notice issued under this Act, is guilty of an offence and liable on summary conviction to a fine of not less than $25 and not more than $500.

APPENDIX 3

County of Leduc No. 25

Notice To Prohibit the Seeding of Land

To ..... Address ..... ALBERTA

You are hereby notified that approximately ..... acres on

the ..... quarter of Section ..... Township ..... Range .....

West of the ..... Meridian as indicated on diagram

are infested with .....

.....

.....

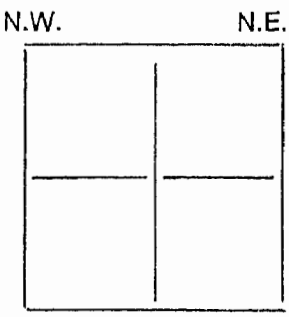
which have been declared noxious weeds under The Weed Control Act, and you are hereby directed not to seed or allow to be seeded

with the above portion of land with .....

.....

.....

Section



Location of Weeds

until consent to do is issued in writing by TheWeed Inspector or as indicated in Section 20 (2) of The Weed Control Act (See Reverse side)

If this notice is not complied with action will be taken in accordance with the provisions of the Weed Control Act.

Date ..... 19 .....

Inspector

County of Leduc No. 25
Box 250 Leduc, Alberta T0C 1V0

Issued under authority of Section 20 (1) of "The Weed Control Act."

IMPORTMENT: See Reverse side.

APPENDIX 3

Notice to Prohibit the Seeding of Land (Contd.)

Prohibiting crop sowing

20. (1) Where an inspector finds noxious weeds or weed seeds on any land, he may, in order to effectively destroy the noxious weeds or weed seeds, issue a notice prohibiting the occupant or owner of any land from sowing a crop of any kind on the land.

(2) A notice issued under subsection (1) shall cease to have effect three years following date of issue, unless it is sooner rescinded by the inspector.

Appeal to council

Appeals

38. Any person

(a) who has an interest as owner or occupant of land,

(b) who is affected by any action taken or notice given by an inspector, and

(c) who thinks himself aggrieved by the action or notice,

may appeal to the council of the local authority which shall hear and determine, or shall by resolution appoint a committee to hear and determine, the appeal.

Notice of appeal

39. (1) Every notice of appeal shall be in writing and shall set out

(a) the name and address of the appellant,

(b) the description of the notice or action from which the appeal is being taken,

(c) the legal description of the land affected, and

(d) the grounds for appeal,

and shall be mailed or delivered to the municipal secretary

(e) in the case of an appeal from a notice, within the time specified in the notice for taking any action or within 15 days, whichever is less, or

(f) in the case of an appeal from any action taken by an inspector, within 15 days of such action being taken.

(2) The notice of appeal shall be accompanied by a deposit in the sum of $10 which shall be returned to the appellant if the appeal is allowed but shall otherwise be forfeited and becomes the property of the local authority.

(3) The municipal secretary shall forthwith upon the determination of the appeal forward a copy of the decision and the reasons therefor, if any, by mail to the appellant at his address shown shown on the notice of appeal and to the inspector.

Offence and penalty

Offences and Penalties

42. Any person who contravenes any of the provisions of this Act or the regulations or of any notice issued under this Act, is guilty of an offence and liable on summary conviction to a fine of not less than $25 and not more than $500.

APPENDIX 3

COUNTY OF LEDUC No. 25

Consent to Rescind "Notice to Prohibit the Seeding of Land Infested with Noxious Weeds"

To .....

.....

You are hereby notified that the notice to forbid the seeding of approximately .....

.....

acres on the ..... quarter(s) of Section ..... Township ..... Range .....

West of the ..... Meridian, issued under Section 12 of The Noxious Weeds Act, R.S.A. 1955,

on the ..... day of ..... 19..... is hereby rescinded, and consent to cause, suffer or permit such land to be seeded is hereby given.

The rescinding of the said notice does not mean, nor shall it be construed to mean, that the owner or occupant of the said land is for any period of time whatsoever, relieved from any duty imposed upon him by "The Noxious Weeds Act, R.S.A. 1955".

DATE ..... 19.....

.....
Inspector

.....
Address