WEED PROBLEMS IN OTAGO AND SOUTHLAND

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A REVIEW of the weed problems in Otago and Southland is difficult because of the wide area covered and the vast range of temperature, rainfall, and climate.

In rainfall, for instance, Otago and Southland cover an area in which we find some areas receiving the minimum fall to areas like Fiordland, where the rainfall can reach over 90in. a year.

In topography also we have again these striking contrasts. In the north we have our flat coastal strip, extending from Oamaru south and stretching west, forming the foothills of the Southern Alps.

In Central Otago we have a typically continental climate of high summer temperature and equally cold winters. Dry, arid, rocky country, but capable of wonderful returns if water is available for irrigation; country also capable of growing a tough variety of weed.

On to the Taieri Plain and south to Balclutha—rich river flats; silt based land, but capable of growing an enormous number of undesirable as well as desirable plants.

South-west to Gore and the plains of Southland—stretching further south to Invercargill and north and west to the Lakes District and Fiordland—a large expanse of country of which a little over a third is sown in grasslands. It is wonderfully fertile where it is being farmed and capable of large increases in production.

That is a rough picture of the country; how can we study the weed problems?

Over the area as a whole certain weeds seemed to stand out as being present in almost every district; in other words there were weeds which had a national flavour.

Again it became obvious that although farming varied considerably from district to district, there were some features that were common to all. These features were as follows:—

- (1) All farmers relied on pastures for their grazing.
- (2) In almost every district some form of cropping was carried out.
- (3) All areas had their share of waste places or marginal lands, where a good variety of brushy weeds were present.

It is therefore under these headings that I think we can examine the weed problems of Otago and Southland. Some criticism may be made that the presentation should have been made according to districts. I can only say that one would have needed an intimate knowledge of each individual district to do justice to this and the resultant paper would have exceeded the time limit very considerably.

It is my intention to try and give a general picture of our weed problems. There are many speakers to follow, some of whom are to deal with these problems in particular.

I would therefore commence by saying that of all the weeds found on pasture lands the thistle stands out as being No. 1.

SCOTCH THISTLE (*CIRSIUM LANCEOLATUM*)

There is a very definite increase of Scotch thistle on all our pasture land. More particularly is this so on our higher-fertility land. The sight of an occasional Scotch thistle used to be regarded as a welcome sight and an indication that the land was getting into good heart. Today some of the infestations have to be seen to be believed. Hormone weedkillers have given excellent control, provided timing is correct and many farmers have to embark on an annual spray programme to keep the maximum grazing areas clear.

CALIFORNIAN THISTLE (*CIRSIUM ARVENSE*)

Californian thistle seems to be getting a little more prevalent and a little more aggressive in some parts. Easily our most difficult pasture weed to handle. Most farmers embark on either a mowing or spraying programme or both. It is impossible to eradicate in one spraying. Good results are being obtained by persistent treatment, and provided care is taken in amounts used and time of application is watched, this weed can be successfully controlled. On Southland pastures farmers have to be careful in the use of hormone weedkillers on this weed due to the risk of clover damage, which can be detrimental at a time when lambs require maximum feed.

RAGWORT (*SENECIO JACOBEEA*)

Ragwort occurs in varying concentrations in Otago, but in parts of Southland it is a real menace. Indeed, it can almost be said to be a native of Southland, because in early times the disease of the liver that used to follow the eating of the weed by horses used to be known as Winton disease, because it occurred around the Winton district in Southland.

Where the farmer is engaged principally with dairying it is a constant problem keeping this weed in control and I am afraid in many parts the control leaves much to be desired. It has been standard farming practice on all Southland dairy farms to keep a number of old ewes "just to keep the ragwort down". This has provided a measure of control provided none of the weed is allowed to seed.

On the smaller acreages strict control measures have to be adopted, because if the situation is not carefully handled, sheep have to be increased until they begin to compete with the dairy herd for fodder. Spraying with hormone weedkillers is giving great relief, but in Southland certainly I would say that any change in our economy which would tempt our farmers to change from meat and wool production to straightout dairying would put ragwort into the category of public enemy No. 1.

FLAT WEEDS

Right through both provinces we have, of course, the flat weeds in our pastures, but this is more so in the areas where we have river flat country—parts of Southland—round the Inch Clutha area, and Taieri Plain.

The main weeds in this group would be plantain (*Plantago major*), catsear (*Hypochaeris radicata*)—sometimes called Cape weed—and of course dandelion (*Taraxacum officinale*).

There is, however, one other that causes a lot of worry on closely grazed country and that is the small field daisy (*Bellis perennis*).

This small but prolific seeder is becoming well established in some parts of Southland. Difficult to eradicate, it responds to spray treatment when this is combined with a fertilising and oversowing programme.

WEEDS OF CROPS AND CULTIVATED LAND

Weeds of crops and cultivated land are: Wild turnip (*Brassica campestris*), fat-hen (*Chenopodium album*), shepherds purse (*Capsella bursa-pastoris*), thistles (Scotch and Californian), spurrey (*Spergula arvensis*), penny cress (*Thlaspi arvensis*), fumitory (*Fumaria officinalis*), red shank (*Polygonum persicaria*).

These would seem to cover most of the weeds that occur in our crop and cultivated lands. Of these Californian thistle is probably still one of the most aggressive to handle but spurrey or, as it is most generally called, yarr is troublesome in some newly sown grass areas and also in brassica crops.

The oily nature of the seed of this plant gives it a persistent character and in a brassica crop the plant is difficult to control by any other method than cultivation. I know many farmers who would like to see some experiments carried out to see if some economic chemical control could be devised. Here again climate and rainfall play a big part in the type of weed that is prominent and the necessary control methods to be used.

WEEDS OF SEED CROPS

Small seeds are now playing a larger part in our farming economy and here again certain weeds in certain crops have to be rigorously controlled in order to market clean seed. Of these ragwort in timothy crops, plantain in fescue crops, and docks and thistles in clover crops are all problems for the farmer who is engaged in the production of small seeds. Spraying has given farmers a tremendous help in marketing clean seed free of weeds.

WEEDS OF MARGINAL LANDS, ROADLINES, WASTE PLACES

Weeds of marginal lands, roadlines, and waste places is a title which certainly covers a very wide range of country and includes some of our most prolific and dangerous weeds. Shortage of labour in some cases is the reason the problem is not receiving the attention it deserves.

The most aggressive weeds in this type of country must surely be gorse (*Ulex europaeus*) and broom (*Cytisus scoparius*).

Gorse and broom can easily be classified as the two most prevalent and aggressive weeds in the provinces of Otago and Southland. Gorse seems to be on the increase on some of the hill country and marginal lands, especially where top cover has been destroyed by burning. Hormone weedkillers have given the farmer a quick and reliable method of control on roadlines and other accessible parts of his farmlands, but the sturdy vigorous nature of their growth and the prolific nature of their seeding make these plants a problem which calls for strong action at all times to gain control.

In treating broom with hormone weedkillers we have seen some excellent kills, but there are still far too many cases where regrowth has commenced the following season from bushes which up to that time had appeared to be virtually dead.

Sweet Brier (*Rosa eglanteria*)

Sweet brier is another of our noxious weeds which is causing concern in some parts of the provinces. It does not respond very well to spraying and regrowth invariably follows this method of control. Another point with brier in parts of Central Otago is the alarming increase in the weed since the wholesale destruction of the rabbit. Apparently the rabbit used to eat the young brier shoots and exercised a certain reasonably effective control. This is a problem in country which is not accessible and one which I understand will be covered by other speakers later on in this conference.

Hemlock (*Conium maculatum*)

Around the edges of scrub and bushland hemlock is on the increase and it is amazing how quickly it can spread once it gains a hold. It would seem that a good many people do not realise the danger of this plant and one sees, all too frequently, quite large infestations on vacant land around townships and on roadsides which no one appears to be doing very much about. Perhaps some form of national campaign should be undertaken in order to educate the public to its dangers.

St. John's Wort (*Hypericum perforatum*)

Confined mostly to Central Otago St. John's wort also shows up in isolated areas in other parts of Otago.

In his book "Weeds of New Zealand" Hilgendorf refers to St. John's wort in the Lake Wakatipu area near Arrowtown, where whole hillsides were yellow with it.

This was the case about 20 years ago, where this noxious weed had become established on old gold-mining workings. It very soon spread and began to encroach on some of the better-class land.

About 1946 control with insects was tried and this, I understand, has proved most successful.

Blackberry (*Rubus fruticosus*)

Blackberry shows up in many areas in both provinces, but is not the problem it is in parts of the North Island. It responds well to chemical control.

Tutsan (*Hypericum androsaemum*)

Tutsan shows up on waste land and we usually find it establishing around the fringes of bush, especially in damp situations. It is not difficult to eradicate if the job is tackled systematically. It is not one of our problems exactly, but it shows up regularly enough to be included in this list.

Tutu (*Coriaria ruscifolia*)

Tutu is one of our poisonous weeds and one that takes its toll of cattle and sheep each year when conditions are such that stock are tempted to nibble at it. It responds to treatment and hormone weedkillers, but on account of the difficult country it usually grows in some of it goes unsprayed until stock losses make it imperative to take action.

Fern or Bracken (*Pteridium esculentum*)

One of the difficult types of scrub weed to control—periodical burnings seem to be one method of control, followed by the crowding of stock on to the area where possible. I understand that some experimental work has been carried out using a new chemical as a means of control—I'm sure our farmers will be interested to hear a little more about this material.

Horehound (*Marrubium vulgare*)

Horehound is a weed of waste places, usually found around sheep camps. After it has flowered the seed heads are readily carried away in the wool of sheep and it is quickly spread as a result. It is confined mostly to the high country.

Manuka (*Leptospermum scoparium*)

Manuka presents a problem in some areas. But where the farmer can use heavy machinery the problem is much easier and one sees some wonderful jobs being carried out with heavy ploughs and discs.

Cutty Grass (*Carex gracillius*)

The amount of cutty grass on any one farm would not amount to very much, but given the slightest bit of dampness this member of the sedge

family spreads rapidly on to valuable pasture land. It is especially aggressive when it becomes established over the line of the tile drain and in a short time we find that the roots have penetrated the tiles and the drain has to be opened up, cleared, and replaced. Many Southland farmers consider this one of the most exasperating weeds with which they have to deal and would welcome any form of chemical control that could be employed without damage to pasture species.

That would cover most of the prevalent weeds in our provinces. There is no doubt that there are others, some of which could possibly have been included in this paper had time permitted.

HOW ARE WE TACKLING THESE PROBLEMS?

1. By good farming: Good farming methods must be the prerequisite to any form of weed control. Good management, correct times of sowing, and good thorough cultivation must always be practised if our farmers are to reduce to a minimum the weeds in their crops or to prevent ingress into their pastures and destroy the palatability of the grass.

2. By chemical control: Otago and Southland farmers may have been a little slower than their northern friends in accepting the "new fangled" chemical methods of weed control as introduced with hormone weedkillers.

Today, however, the story is a very different one and chemical weed control is accepted as an essential part of normal farm routine. Indeed it has opened up fresh hope for many farmers who are now able to control weeds in pastures, harvest clean seed and grain crops, and control and eradicate brush weeds such as gorse and broom with the minimum of labour.

On the machinery side one finds that the weed sprayer is almost standard equipment on farms today.

Public bodies and councils everywhere are taking an active and practical interest in this form of weed eradication.

As newer and more selective weedicides become available I see an even greater extension of this form of control.

3. Biological control: Weed control is being carried out using insects on the following weeds:—

Manuka (using the *Eriococcus* scale blight): There is one block in the Balclutha area and one or two other small areas where this blight seems to be getting established and doing good work.

St. John's wort (using the parasite *Chrysolina hyperici*): I understand that since the introduction of this form of insect control in 1946 some large areas of the weed have been completely controlled. Apparently this small insect is doing a wonderful job in the country around Queens-town, Arrowtown, and the Shotover basin. The information given me by officials in that area makes a very interesting story and one, I feel, that could well have been given prominence at this conference. In an area that does not lend itself to any form of mechanical or chemical control this seems the perfect answer. What a pity we cannot introduce some similar form of control for brier.

4. Ecological control: Here again is a long-range plan of weed control, but a very effective one and in many places in the provinces one sees the value of tall growing species gradually eradicating the short, slower growing types. One area I have seen is on the lower foot-hills of the Maungatuas, just south of Dunedin, where *Pinus* trees planted in gorse infested gullies are gradually gaining control of the gorse by shutting out the sunlight and air.

WHAT OF THE FUTURE?

A great consciousness of weed problems has come about as a result of several factors. It is a gradual build up brought about largely, I think, by articles which appear from time to time in our farming journals and the information gained from localised field trials by officers of the Department of Agriculture, etc.; the dissemination of information by reputable commercial interests; and the interchange of information made available by conferences such as we are commencing here this morning, where specialists from our various Government departments, commercial interests, and practical farmers are gathered to discuss the many problems associated with weed control work.

At the 8th Science Congress held in Auckland earlier this year one speaker stressed the fact that in 20 years New Zealand's population would exceed 3 million and in order to preserve our balance of trade overseas and feed this additional population our primary production must be stepped up by at least 60 per cent.

Part of this will come from fresh land being brought in all over New Zealand; part of it will come as a result of improved breeds of stock and improved farming methods.

It must also be obvious, however, that weed control could play a tremendous part in giving us part of this extra production, assist our national economy, and help to maintain the standard of living we enjoy today.

DISCUSSION

Q.—How many counties in the South Island are administering the Noxious Weeds Act?

A.—I know of only three counties.

Q.—I should like to ask two questions on manuka blight in the Otago-Southland district.

1. What is the reaction of the public to its spread?

2. How fast is it spreading?

A.—There are a few small areas of manuka blight; one is near Balclutha. I understand it is not establishing very well in most areas.

Comment: Manuka blight has only spread 1 chain in several years at Lawrence. At Rankleburn, near Tapanui, it has taken 5 years to go $\frac{1}{2}$ chain. At Redcliff it is also very slow to spread. This slow spread may be a good thing in that it is giving other vegetation time to establish under the dying manuka with the result that there is no danger of erosion.

Comment: I know four areas in South Otago where the manuka blight has been started, and its spread is very slow. There is certainly no likelihood of soil erosion there due to the spread of the blight, and it is doing a good job on land that is not cultivable. Most farmers are interested and keen to try it out.

Comment: I believe in other areas it has started slowly, and then speeded up.

Q.—Does it only attack manuka?

A.—(Saxby). The blight certainly kills manuka and also attacks kanuka to some degree. There have been many reports of other plants being attacked, but on investigation these have all proved to be without foundation.

Comment: Mr. Marshall used the term ecological control when referring to the smothering of gorse with pine trees. I think this is a misleading term and where referring to the replacement of an undesirable type of vegetation with a desirable type it is better to use the term replacement control.