

WITH PARTICULAR REFERENCE TO REGROWTH PROBLEMSby G. W. Douglas<sup>+</sup>1. INTRODUCTION

Ragwort (Senecio jacobaeae L.) has been a serious weed problem in Victoria for about 40 years. Infestations of this weed are mainly confined to high rainfall regions in Southern Victoria in the Strezlecki Ranges in Gippsland and in the Otway Ranges in South Western Victoria.

Since about 1952 field work for the control of ragwort has been largely confined to the use of selective weedicides. In particular, the ester form of 2,4-D has been extensively used until the ragwort plant starts to shoot up to flower, when contact weedicides have been used to prevent flowering.

The results of the initial research work with selective weedicides were published by Eadie and Robinson (1953) and the position was reviewed by Parsons (1954) at the last Weeds Conference. During the last 8 years every field officer (inspector) in the Vermin and Noxious Weeds Destruction Board in Victoria in ragwort infested areas has intensified the spraying of ragwort with ester 2,4-D and has built up the necessary spraying equipment and gangs of men for this work. It is a general comment amongst field staff that the 2,4-D esters gave good results in the early years of using but, that in recent years, results have not been so good. Whilst good "kills" can be obtained now, much evidence has been obtained in the last 2-3 years to show that there is an increasing regrowth problem with ragwort when it has been sprayed with 2,4-D esters.

2. NATURE OF REGROWTH PROBLEM

Generally the regrowth problem can be put into three types:-

(a) ragwort plants sprayed with 2,4-D esters at rates varying from 2-3 lbs. of acid equivalent per acre in from

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<sup>+</sup> Department of Lands and Survey, Victoria.

40-80 gallons of water per acre have continued to grow and flower. Some of the sprayed plants have exhibited typical 2,4-D symptoms, but have continued the growth process. In many cases seeds from flower heads of sprayed plants were not fertile Parsons (1954). This type of regrowth was noted by Eadie and Robinson (1953).

The ester 2,4-D materials used have been of good quality, they had been well mixed, adequate quantity of liquid had been placed on the sprayed ragwort plants, but they have continued in their growth process.

(b) Ragwort plants have been heavily affected by the 2,4-D ester material to the extent that the top foliage and portion of the crown had been destroyed, but the plant regrows from the remaining crown. This is a fairly common picture in some districts. Where the spraying has been done by Departmental gangs on both Crown and private lands the problem presents itself as a serious economic one. It means that the area has to be re-sprayed or re-treated at another time with contact weedicides such as polyborchlorate or atlacide.

(c) Ragwort plants well sprayed have apparently died. Inspection of the sprayed areas shows that all the top foliage has died and the crown has rotted away. The general consensus of opinion by our field staff would state that a 90% or better kill was obtained. However, about 3 months after the spraying small plants which resemble seedlings appear, and on investigation are clearly shown to be regrowth from the small root particles that have survived the 2,4-D spray. Further, the spray material appears to have travelled down the old root for some distance, but translocation has not been completed, and the residual root particle regrows. An intensive survey into the extent of this root particle regrowth in particular was recently undertaken in the ragwort infested areas of Victoria by the author and it is fairly safe to say that this problem exists in all areas, irrespective of the proprietary brand of spray material used, the quality of the spraying, and any other factors such as climate, aspect and so on.

There is also another relevant observation regarding this regrowth problem. In some districts under the control of a very competent Inspector, good "kills" have been reported after the first spraying. In the next season small plants of ragwort are obvious and pasture establishment, where possible, is observed to be good.

However, in the third season some of the areas where the good "kills" were obtained in the first season contained as much, or more, ragwort than was the case when the infestation was first sprayed. It would appear that this excessive growth in the third season is not all seedling growth.

### 3. DISCUSSION

This problem of regrowth is not an easy one to deal with. It appears that the quality of hormone is not the main factor, and quality of workmanship is apparently satisfactory. Whilst this problem has been observed only recently in many districts, it appears to have existed for some time. It is suggested that some of the earlier results with hormone-type weedicides did not actually give the percentage "kills" claimed and that the "seedling growth" observed in many cases was actually regrowth from root particles of sprayed plants. This suggestion is supported by evidence obtained during 1959 from plots sprayed in an area previously never sprayed (i.e. virgin ragwort), together with the widespread evidence obtained from field inspections in many districts.

This rather complex problem again highlights the need for basic ecological work on plants. Further, there is obviously need for physiological work in this field to help understand the translocation of selective weedicides in plants. The small healthy root particles referred to above are perhaps evidence of incomplete translocation.

There is also a big economical problem to be solved in this regrowth problem in ragwort. If this trend in regrowth increases (and it appears to be doing so) the use of selective weedicides is questionable, particularly if entry or contact spray work is carried out because results will not be satisfactory. Much of the present spray equipment is designed for selective weedicides and could not be used for non-selective weedicides. These latter weedicides could not be used on a large scale because many areas would be "burnt off" if all ragwort were sprayed.

There is therefore a really urgent need to undertake more basic work on this problem.

It is a general practice in ragwort control to cease using selective weedicides once the ragwort plants reach the budding stage of growth. Non-selective weedicides are then used and polyborchlorate, atlacide, and arsenicals are the main ones used. There have not been many reports on regrowth of ragwort arising from the use of non-selective weedicides, but this point will be carefully watched from now on.

#### 4. REFERENCES

Eadie, I. McL., and Robinson, B.D. (1953). - "Control of Ragwort by Hormone-type Weedicides". J. Aust. Inst. Agric. Sci. 19 : 192-6.

Parsons, W.T. (1954). - "A Review of Recent Research on Ragwort in Victoria". Proc. Aust. Weed Control Conf.