A REVIEW OF RECENT RESEARCH ON RAGWORT IN VICTORIA

By W.T. PARSONS

I. INTRODUCTION

The work of Eadie and Robinson (1951)* showed that the MCPA - 2,4-D group of hormone type substances was more effective on Ragwort (Senecio Jacobaea L.) than 2,4,5-T in the seedling and rosette stage of growth. In 1952 it was decided to continue this line of research by comparing various forms of 2,4-D and MCPA at various rates of application and at various growth stages.

II. TRIALS

(a) Seedling-rosette Stage - An experiment was carried out in the Otway Ranges in mid-November 1952 to determine the susceptibility of ragwort in this stage of growth. The following materials were used at rates of 1, 2, 3 and 4 pounds of acid equivalent per acre in forty gallons of water per acre - sodium salt of MCPA, sodium salt of 2,4-D, triethanolamine salt of 2,4-D and the ethyl ester of 2,4-D. Five fixed quadrats were used on each plot to measure the density of the infestation and each plot was replicated four times.

(b) Cabbage-prebudding Stage - This experiment was carried out in Gippsland in mid-December 1952 when most of the plants were either in the cabbage stage or had "run up" to prebudding. The same materials, rates of application and experimental procedure were used as above.

(c) Flowering Stage - Plants in full flower were sprayed with 0.05%, 0.1% and 0.2% solutions of the sodium salt of MCPA, sodium salt of 2,4-D, triethanolamine salt of 2,4-D and the ethyl ester of 2,4-D in January 1953 in Gippsland. Bags were placed over the heads several weeks after spraying and the seeds allowed to mature in the field. A similar experiment was conducted in January 1954.

III. RESULTS

(a) Seedling-rosette Stage - Final counts were made twelve months after the treatments and the results were analysed statistically. From this it was apparent that

* Eadie, I.McL., and Robinson, B.D. (1951) - Control of Ragwort by hormone-type weedicides. J.Aust.Inst.Agric.Sci., 19 : 192 - 6

there were no significant differences between the materials used. The 2 lbs/acre rate, which gave approximately an 84% kill, was significantly better than the 1 lb/acre rate. The percentage kill at the 3 lb/acre rate was not significantly better than at the 2 lb/acre rate.

(b) Cabbage-prebudding Stage - This experiment was treated similarly to the above and it was again apparent that there were no significant differences between the materials used. Here again the 2 lb/acre rate was significantly better than the 1 lb/acre rate but not significantly lower than the 3 lb/acre rate. The percentage kill at the 2 lb/acre rate was approximately 71%.

(c) Flowering Stage - Germination tests were made on the seeds collected with the following results.

Percentage Germination of Ragwort Seeds

Year	Control	Treatment (percent solutions)															
		M.C.P.A.				Sodium 2,4-D				Amine 2,4-D				Ester 2,4-D			
		0.05	0.1	0.2	0.4	0.05	0.1	0.2	0.4	0.05	0.1	0.2	0.4	0.05	0.1	0.2	0.4
1953	76	45	18	6		31	19	31		17	9	9		1	1	1	
1954	64		63	12	3		10	8	0		29	11	2		8	0	0

It is apparent that the ester form of 2,4-D is the most effective in reducing the fertility of the seeds, particularly at the 0.2% and 0.4% rates. These rates also gave a high percentage kill of the plants treated.

IV. DISCUSSION

The 2 lb/acre rate of any of the materials used is the most satisfactory up to the prebudding stage under Victorian conditions. Increasing the rate does not give a corresponding increase in kill and is not justified. With boom spraying a higher percentage kill was obtained in the seedling to rosette stage of growth than in the cabbage to prebudding stage.

It is felt that the actual reduction in density of ragwort in the field will be greater than indicated by these experiments. It was found that most of the plants counted on the 2, 3 and 4 lb/acre plots twelve months after the

treatments were seedlings which had germinated since the sprayings. With the elimination of the older ragwort plants the pasture species come away rapidly and, if sown down, top dressed and not overgrazed, the small amount of seedling growth should be eliminated by competition. This is the aspect of control which is now being encouraged in Victoria.

Because of the uncertainty of the weather in the Victorian ragwort areas, the ester form of 2,4-D is recommended. Experiments have been carried out immediately before rain and under these conditions the esters have always shown their superiority.

In the flowering stage the esters give consistently better results than the other forms of 2,4-D and MCPA used. A thorough spraying with a 0.2% - 0.4% emulsion of ester 2,4-D in the flowering stage will give a high percentage kill of the plants as well as render the seeds sterile.

The use of the hormone type weedicides has greatly extended the period in which ragwort can be successfully attacked in Victoria. A high percentage kill can be obtained in any stage from seedling to flowering and, if this is combined with pasture improvement, eventual elimination can be aimed at.