



Department of
Primary Industries and
Regional Development

Journal of the Department of Agriculture, Western Australia, Series 3

Volume 4
Number 2 March-April, 1955

Article 21

3-1955

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Recommended Citation

Meadly, G.R W. and Pearce, G. A. (1955) "A further chemical trial with doublegee (Emex Australis)," *Journal of the Department of Agriculture, Western Australia, Series 3*: Vol. 4: No. 2, Article 21.

Available at: https://library.dpird.wa.gov.au/journal_agriculture3/vol4/iss2/21

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A normal doublegee plant on the right compared with a plant affected with 2,4-D. Although the sprayed plant has received a check in growth and the characteristic swelling is present, it has not been killed.

A FURTHER CHEMICAL TRIAL WITH DOUBLEGEE

(*Emex Australis*)

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IN the Journal of Agriculture, Vol. 3, No. 4, July-August, 1954, details were given of experimental work with doublegees and the following conclusions were reached:—

“Various formulations of 2,4-D used at a wide range of acid equivalent levels have not proved really effective against doublegees and could not be considered as a means of eradicating this plant or even causing a reduction in establishment the following year.

“As with a number of other weeds, somewhat better results have been obtained under crop than under pasture conditions. The spraying of doublegees in a crop, particularly when other susceptible weeds are present, could be an economical undertaking in areas where this weed is vigorous

and strongly competitive. Although a high proportion of kill cannot be expected, 6 oz. of acid equivalent per acre of the ester of 2, 4-D has caused suppression of growth for a period and could result in considerable advantage to the crop if applied when the weeds are small. Doublegees have been affected to a greater extent by the ester than by similar quantities of the amine or sodium salt of either 2,4-D or M.C.P.A.

“The volume of solution applied does not appear to be an important factor as was suggested at one stage. Reducing the

volume from eight to four gallons, applied with a low-volume boom caused no improvement and similar results followed the application of the same quantity of active chemical in two gallons per acre by means of an aircraft.

"There is evidence to indicate that treatments are more effective in the northern portions of the wheatbelt, possibly associated with more rapid growth in the early part of the season. This apparent advantage is offset by the fact that in those districts doublegee tends to germinate over a longer period."

FURTHER TRIALS

Following on some field observations it was decided to undertake further trials in 1954 based on two similar chemical applications to the same area, the second to be applied a short period after the first. The chemicals used were the amine salt and ethyl, butoxyethanol and alkyl-hexyl esters of 2, 4-D. Each was applied at the rates of 6, 12 and 16 ounces of acid equivalent in seven gallons of water per acre. Each treatment was replicated three times and 12ft of the initial 24ft. wide plot was resprayed two weeks after the first application. The trial was undertaken at the Chapman Research Station and at Beverley.

CHAPMAN RESEARCH STATION

The various treatments were applied to doublegees in a wheat crop on 21st July, 1954, when the crop was stooling and about 9in. high and the doublegees were 4-10 in. in diameter. Spraying was carried out in warm sunny weather after eight points of rain had fallen the previous day. There was a further ten points the day after spraying. Owing to the rapid growth of the crop, and in order to avoid the vulnerable "boot" stage, the second application to half of each plot was made nine days after the initial treatment, 46 points of rain fell the next day. The plant mortality resulting from the treatments is shown in the accompanying table.

All doublegee plants showed effects of 2, 4-D and the final counts were made at a time when further recovery could not be expected. Some of the plants regarded

as having survived would not have produced mature seeds. A high degree of control was obtained from all treatments including six ounces acid equivalent per acre, the rate used frequently for wild radish. A double application at that level gave complete control.

| Treatment. | % Plants Killed. | |
|--------------------------------------|--------------------|--------------------|
| | Single Application | Double Application |
| 1. 6 ozs. Amine Salt | 83 | 100 |
| 2. 12 ozs. Amine Salt | 95 | 100 |
| 3. 16 ozs. Amine Salt | 96 | 100 |
| 4. 6 ozs. Ethyl Ester | 85 | 100 |
| 5. 12 ozs. Ethyl Ester | 96 | 100 |
| 6. 16 ozs. Ethyl Ester | 99 | 100 |
| 7. 6 ozs. Butoxyethanol Ester | 91 | 100 |
| 8. 12 ozs. Butoxyethanol Ester | 94 | 100 |
| 9. 16 ozs. Butoxyethanol Ester | 100 | 100 |
| 10. 6 ozs. Alkyl-hexyl Ester | 93 | 100 |
| 11. 12 ozs. Alkyl-hexyl Ester | 93 | 100 |
| 12. 16 ozs. Alkyl-hexyl Ester | 97 | 100 |
| 13. Control | ... | ... |

BEVERLEY

The same experiment was repeated at Beverley. The doublegees ranged in size from 2-8in. in diameter while the wheat crop was approximately 6in. in height. The first spraying was carried out on August 3rd, a cool cloudy day, and the second application was made on August 24th. Seventeen points of rain fell the day after the first treatment and a week of fine weather followed the second application. Although the growth of the doublegees was checked on all plots, particularly those which received two applications, no significant control was obtained with any treatment. The plants recovered and seeded freely.

At Beverley the second spraying was made 21 days after the first compared with an interval of nine days at Chapman. The doublegees were showing effects of the initial treatment at the time, however, and it is doubtful whether the longer period between treatments contributed to the difference in results. The more rapid growth, evident in both crop and weeds, is likely to have increased the effectiveness of the treatment at Chapman.

After a further season of experience and experimental work with doublegee, we can only repeat the conclusions made previously and stress the variability of results following spraying with 2, 4-D herbicides.