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B J. Quinlivan

J. R. Pierce

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Cover Page Footnote

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RESULTS FROM RECENT RESEARCH // a technical report

DORMANCY AND LIFE SPAN OF SAFFRON THISTLE SEEDS

By B. J. QUINLIVAN and J. R. PIERCE

RESEARCH in the Geraldton area has indicated that seeds of the saffron thistle (Carthamus lanatus) spread their germination over some seven years but most germinate in the first two years. Factors influencing the rate of germination and the survival of seeds are the depth of burial and the presence of termites in the soil.

Saffron thistle is a widespread and troublesome weed in Western Australia. In pastures it prevents access and reduces carrying capacity—in cereals it decreases yield and results in dockage. The weed is readily controlled by cultivation, spraying, mowing, burning or grazing, but is difficult to eradicate because of the presence of dormant seeds. This research examined the germination of a single seed crop to provide a basis for planning long term control measures.

Methods and results

Seeds were collected from standing saffron thistle plants in December, 1960, stored in a glasshouse over summer, then planted at Chapman Research Station in April, 1961. Seeds were planted at depths of zero, one, two, three, four and six inches in a red brown loamy sand.

During the growing seasons of 1961 to 1966, germinated seedlings were counted and removed with the results shown in the table. Most seedlings emerged each year within a month of the opening autumn rains.

In June, 1966, the area was excavated and it was found that termites had destroyed almost half the ungerminated seeds at the lower depths. A total of 1,000 apparently sound seeds were collected and replanted—500 at one-half inch and the rest at four inches. Of the 500 planted at one-half inch, six germinated in 1966, 10 in 1967 and one in 1968. No seeds germinated from the four inch depth.

The ungerminated seeds were excavated in 1968. Some of these had been destroyed by termites but no whole seeds were viable.

Conclusions

The results indicate that, in the Geraldton area, saffron thistle seeds germinate mainly in the first two years. The proportion of seeds capable of germinating falls sharply as the depth increases and few seeds germinate from depths below two inches. Although some seeds may remain viable for as long as eight years, most ungerminated seeds are fairly rapidly destroyed by termites, fungi or bacteria.

It appears that control programmes based on cultivation, burning, spraying or mowing require two or three years intensive effort, followed by several more years to control isolated plants.

At least some thanks are due to the termites and various soil borne fungi which thrive in the warm environment of the Geraldton area. In cold European and North American climates, similar thistle seeds have been known to survive in the soil for 40 years or more.

Acknowledgments

Thanks are extended to Mr. H. A. Pearce, Weed Control Officer, Department of Agriculture, for his assistance with field work during the experiment.

SEEDLING EMERGENCE OF SAFFRON THISTLE PLANTED IN 1961

Depth of planting (inches)	Percentage of original seeds germinating						
	1961	1962	1963	1964	1965	1966	Total
Surface	18.4	36.1	4.6	....	....	....	59.1
1.	8.2	27.3	1.2	0.1	....	....	36.8
2.	1.2	2.2	....	....	....	....	3.4
3.	....	....	0.1	0.1	....	....	0.2
4.	0.6	0.2	....	0.2	....	....	1.0
6.	....	....	....	....	....	....	....