

Because of the low cost of the treatment and the increased growth of pasture due to the removal of competition, the technique is being widely accepted by farmers in Western Australia. In hilly country around Geraldton, where it is impossible to spray apart from using aircraft, large areas are being treated and grazed.

With Paterson's curse (*Echium plantagineum*) it has been found that after 2 years of spray-graze, the density in the third year has been reduced by around 20%. In the fourth year after 3 years of spray-graze, the density has decreased by approximately 75%, and in the fifth year by more than 95%.

In the case of docks (*Rumex crispus*) a significant reduction has been seen after 1 year and after two spray-graze treatments the docks have been virtually eliminated. With saffron thistle, a very significant reduction in seedlings has occurred after four treatments.

The number of years to eliminate the dormant seed bank will obviously vary with the species concerned and the climatic conditions affecting germination.

GALVANIZED BURR - A PROBLEM OF LAND MANAGEMENT

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Galvanized burr (*Bassia burchii*) which infests millions of acres, and threatens millions more, in western areas of New South Wales, is a serious problem. Present adverse economic conditions brought about by drought, low wool prices and wheat quotas have reduced financial resources of many landholders, preventing them from taking adequate action against the plant. Wheat quotas discourage landholders from growing grain crops, which provide a useful control measure. Where the country is suitable only for sheep, the continued spread of the weed will further reduce landholders' economic viability.

Control of the plant in many areas is not in itself economic in terms of improved productivity, but must be carried out to prevent spread on to clean or only lightly infested country. The alarming spread of the weed following the recent drought suggests a much greater spread, following the next drought.

Continuing spread of the weed increases the costs involved in control and further reduces the finance available. Many

landholders could be forced to vacate their properties because galvanized burr has caused them to be uneconomic units.

There is need for research to develop improved control measures, particularly in non-cropping areas.

Galvanized burr (*Bassia burchii*) is a perennial native shrub, producing a mass of spiny seed. It was declared noxious in New South Wales in 1938. The history of the plant indicates that a significant factor in its spread has been by infested sheep from Queensland. A survey of the vegetation of western areas published in 1948 indicates the weed to have been of limited distribution at that time. Infestations in this State were sufficient to cause concern in some areas before the 1965/67 drought. It has spread dramatically since the drought.

The weed is a member of the family *Chenopodiaceae* which contains many useful forage plants including bluebushes, saltbushes, cotton bushes and copper burrs. It has similar nutritive qualities to these, but its spiny nature precludes it as a stock feed in most situations. The plant is an aggressive invader of land denuded by drought or overgrazing, and is readily spread by sheep. Spread by wind, stock transports, road graders, crawler tractors, and water also occurs, but is of less significance.

Large areas in the northern half of the central and western division of the State are infested. Preliminary estimates suggest that at least 4,000,000 to 6,000,000 acres (161880-242820 kg per hectare) carry some level of infestation. Clean land within these divisions is liable to infestation given the right conditions.

INFESTATION AND LAND USE

The area infested has been divided broadly into classes on the basis of level of infestation and land use.

Class 1: This comprises isolated small areas of infestation which could be readily controlled by present methods and in most cases with present financial resources. These infestations indicate the capacity of the weed to spread into high rainfall areas, and southwards, and emphasizes the enormous areas of the State threatened.

Class 2: This comprises areas of serious and light infestations on lands of lower value. Eradication is uneconomic in most cases. Travelling stock routes carry serious infestations. Research and investigation of land management techniques is required to develop methods of land use to control the weed.

Class 3: This comprises areas of serious and light infestations on land of higher value where winter cereals and annual or perennial pastures can be established. Infestations can be greatly reduced using present techniques.

The problem of galvanized burr is one which has many aspects and its solution will require the use of a balanced approach embodying all methods of weed control. Each situation will demand a different balance of ecological, mechanical, chemical, and stock management methods. Adverse economic conditions and an extremely uncertain and difficult to predict environment accentuate the problem.

THE INFLUENCE OF LAND UTILIZATION ON RAGWORT, *SENECIO JACOBAEA*, AND PROBLEMS ASSOCIATED WITH ITS CHEMICAL CONTROL

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The results of a survey in 1967 have shown that ragwort, *Senecio jacobaea*, occurs on nearly 1 million acres (400,000 hectares) of agricultural land and woodland in Victoria, ranging from high-density infestations to areas of isolated plants. The major infestations are in south Gippsland and in the Otway Ranges in the southern part of the State in undulating or steep hill country with elevations up to 2,000 ft (600 m approximately). The average annual rainfall ranges from 39 to 75 in. (990-1,905 mm).

The main agricultural industries in these areas are dairy farming, beef and wool production, and, to a smaller extent, intense cultivation crops. The various types of land use and the standard of agricultural management have a significant influence on the incidence of ragwort. Cattle avoid ragwort; thus on dairy farms and on beef-producing properties this selective grazing encourages the plant's unhindered development and spread. In contrast, sheep eat ragwort readily and the infestations are effectively depressed on a well-stocked property. This can be regarded as a means of reliable, although temporary, control. Although no specific research work has been carried out in Victoria into the control of ragwort by sheep, it is known that ragwort will recover following the removal of sheep after 5 or more years of heavy grazing. Plants reappear in the first year following the removal of sheep, and recovery is usually complete in the second year. Problems therefore arise