

THE WEED SITUATION IN WESTERN AUSTRALIA

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Western Australia represents a complex region ranging climatically from tropical to cool temperate. Besides large seasonal variations in temperature there are rainfall extremes, both in relation to quantity and periodicity. It is understandable, therefore, that with a multiplicity of environments, this region is concerned with a wide range of weeds.

SIGNIFICANCE OF WEEDS IN PRIMARY PRODUCTION

There is a call for weed control in almost every agricultural and pastoral situation. Cereals, being the major crop receive the greatest attention. Of 9 million acres sown in 1968, 1.75 million acres were sprayed for weed control, aerial application being responsible for 1.5 million acres. The main species are wild turnip (*Brassica tournefortii*), wild radish (*Raphanus raphanistrum*), double gee (*Emex australis*), saffron thistle (*Carthamus lanatus*) and wild oats (*Avena* spp.).

The weed problem with crops such as cotton, linseed, and rape is no less significant but smaller areas are involved. Control measures are also necessary with orchards, vineyards and, in particular, vegetable gardens.

Weeds of pastures cause greater losses than are usually recognized. Besides reducing the proportion of desirable herbage and hence the productivity of the pasture, some species such as Cape tulip (*Homeria* spp.) are toxic. Weeds such as blackberry (*Rubus fruticosus*) and cotton fireweed (*Erechtites quadridentata*) leave little space for desirable species. Under drier conditions, competition of a different type is exemplified by mesquite (*Prosopis juliflora*). A close thicket formation almost eliminates other species while little herbage persists under individual trees, presumably due to surface roots monopolizing the available moisture.

PRESENT PRACTICES OF WEED CONTROL

Although cultural methods remain the first line of attack, remarkable advances have been made with chemical weed control during the last twenty years. These were stimulated by the discovery of the phenoxyacetic derivatives and 2,4-D ester

remains the most extensively used herbicide in Western Australia. For many years no effective treatment was available for double gee but this was rectified, firstly with dicamba and subsequently linuron and other formulations. Some of the later herbicides have the advantage of a broader weed spectrum.

The selective removal of a grass from a grass undoubtedly presents difficulties but barban and triallate are used for the control of wild oats in wheat and barley.

The control of weeds in pastures has been retarded by several factors - the cost, damage to the pasture species by the herbicide and lack of conviction by many farmers that action is justified. Interest and activity have been increased by the spray-graze system whereby advantage is taken of the grazing animal. By applying sublethal doses of a herbicide, followed by heavy grazing with sheep, effective control of a number of species including Patersons curse (*Echium* spp.) thistles and docks has been obtained at a reduced cost, with little or no damage to the pasture species.

With the development of more effective total herbicides, increasing interest is being taken in the use of chemicals for destroying herbage in industrial situations, along railway tracks and road verges, and for establishing fire breaks.

In the past years some limited value has been obtained from the Chrysolina beetle with St Johns wort but biological methods have not been used to any extent in Western Australia. We are hopeful, however, that proposed investigations with double gee and caltrop (*Tribulus terrestris*) will be successful.

EFFECTIVENESS OF RESEARCH, EXTENSION AND LEGISLATION IN CONTROLLING WEEDS

Research has certainly paid dividends in recent years, the most spectacular progress being made in the herbicide field, although treatments available for some weeds, including grasses, are not entirely satisfactory. Variability of weed control and crop tolerance are both involved and the cost of treatment is an important factor. Irrespective of the control principle to be used, some of our weed problems should be investigated in greater depth to enable maximum results to be derived from methods available.

Agricultural extension in Australia is frequently criticized and our capacity in the field of weed control is probably no better or worse than in other fields. Farmers appear to adopt recommended practices with cereal crops more readily than with pastures. Crop yields enable them to assess the economic position more accurately and dockages apply if weed seeds in the grain exceed the tolerated level.

Current wheat quotas introduce a further complication as the incentive to obtain maximum yields is reduced and the desirability to minimize costs increased. Three aspects that support continued control measures are, better quality of product, additional area available for other purposes and an improved future weed situation.

Legislation is directed along three main lines - prevention, control, and eradication. Since the Agriculture Protection Board was formed in Western Australia, with availability of staff and finance, prevention, particularly introduction of noxious weed seeds by various means from outside the State, has become much more effective. Measures taken against small infestations have been positive but progress with extensive areas on farmers' holdings is slow. Frequently a substantial reduction in intensity is achieved without reducing the area over which the weed occurs. Farmers tend to lose enthusiasm unless marked progress is apparent and short-term results cannot be expected with weeds having prolonged seed or corm dormancy. Inspectorial staff are now in a position to undertake farm surveys and prepare progressive programmes with individual farmers. Personal contact of this nature encourages greater efforts and reduces the need to exercise authority available under the Noxious Weeds Act.