

Germination and establishment ratings:

A = > 10 plants per sq yd (Excellent)

B = 5-10 plants per sq yd (Good)

C = 1-5 plants per sq yd (Fair)

D = < 1 plant per sq yd (Failure)

Sites:

Sw. = Swanpool

Br. = Broadford

Se. = Seymour

St. = Stewarton

Cr. = Crystal Creek

Lo. = Longwood

Sh. = Sheans Creek

Wo. = Woodfield

Ed. = Edenhope

Ac. = Acheron

Eu. = Euroa

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HERBICIDAL SEEDBED PREPARATION

In the high-rainfall areas of the Adelaide Hills and South-east of South Australia, pastures which have passed through a phase of clover dominance are prone to invasion by annual weed species such as Cape-weed (*Cryptostemma calendula* L.), barley grass (*Hordeum leporinum* Link), sea barley grass (*Hordeum hystrix* Roth), *Erodium*, and *Vulpia* species.

The establishment of perennial grasses, such as perennial ryegrass, Currie cocksfoot, *Phalaris tuberosa*, and *Phalaris coerulescens* into such pastures will increase their productivity and make them less vulnerable to infestation by annual weeds.

Seedbed preparation by conventional cultivation has been found to present a number of difficulties. In most years, periods of wet weather in the late autumn prevent an effective kill of weeds by cultivation, and the cultivation itself tends to raise weed seeds to a depth where they germinate readily. Chemical seedbed preparation, on the other hand, enables the seedbed to be prepared over a wide range of moisture conditions and does not bring buried seed to the surface.

Early screening trials in South Australia showed that diquat (9,10-dihydro-8a,10a-diazoniaphenanthrene cation) was greatly superior to PCP (pentachlorophenol), 2,2-DPA (2,2-dichloropropionic acid), 2,4-D (2,4-dichlorophenoxyacetic acid) ethyl ester, or 2,4-DB (4-(2,4-dichlorophenoxy)butyric acid) for seedbed preparation. The chemical had a wide range of kill, caused rapid desiccation, and had a very short residual effect in the soil. Paraquat (1,1'-dimethyl-4,4'-bipyridylium cation) was later found to have a different range of kill, but was similar to diquat in other respects.

As will be shown later, the rate of diquat or paraquat required to control annual weeds is greatly dependent on the age of the

plant, but diquat at 1 oz ion per acre has been found to control *Erodium botrys*, *E. moschatum*, and Cape-weed, while paraquat at the same rate controls the *Hordeum* species. Neither herbicide will control *Vulpia* species at this rate, and pastures thickly infested with these grasses must be treated by mechanical methods.

Best kill of all species was obtained when they were sprayed 2 weeks after germination, which was the earliest time tested. Establishment of perennial grasses was also best on the earliest sprayed treatment. As time of spraying progressed, the rate of herbicide required became higher.

The time at which the perennial grasses were sown in relation to spraying showed no consistent trend, except that sowing a week before spraying markedly reduced establishment.

Grazing intensity during the winter and spring following sowing determined the difference in establishment between the unsprayed treatments and the various rates of herbicides. If plots were ungrazed, no establishment of any species on unsprayed plots was obtained. As grazing intensity increased, so the difference between sprayed and unsprayed treatments became less.

Reinfestation by annual weeds in the year following sowing was lower at higher rates of herbicides. This was partly due to a direct effect of the chemical in reducing the amount of seed produced by the weeds, but also due to greater pasture vigour on these plots. When the chemical treatment was sufficient to allow a successful establishment of the pasture, the degree of reinfestation was dependent on the vigour of the species of grass sown.

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#### CHEMICAL FIREBREAKS

The idea of using herbicides for making firebreaks is not new, but greater interest is being shown by farmers as they become more aware of the dangers of erosion and the advantages to be gained. Their use around industrial sites and buildings in general is quite common.

In 1964, a chemical firebreak trial was undertaken on eight research stations in different parts of Western Australia. The treatments used at each of the sites and the time of application is shown in the Table. Plots were 300 feet by 6 feet and the treatments were not replicated. Spraying was undertaken in a volume of 100 gallons of water per acre. Wetting agent was added to treatments where paraquat (1,1'-dimethyl-4,4'-bipyridylum cation) or diquat (9,10-dihydro-8a,10a-diazoniaphenanthrene