sites showed no differences in susceptibility to picloram residues, so the following comments refer to all three medic species.

Picloram residues from applications the previous year affected medic growth in all experiments, but were most severe in 1968 following the drought. Generally, 2-4 oz per acre (0.14-0.28 kg per hectare) applied in the winter killed all medic the following year, but after application in the drought year, even 0.14 oz per acre (0.01 kg per hectare) reduced the medic population by 68%. In dry years, spring-summer applications of picloram had less effect on subsequent medic growth than winter applications, suggesting photodecomposition of the herbicide.

CONCLUSIONS

At the rates tested, soil residues of picloram from fallow application reduced subsequent wheat yields in only one year out of four (1968), while undersown medic was affected every year, particularly in 1968. It is concluded that seasonal conditions determined the extent of picloram residues through microbial break-down and photodecomposition, and possibly also through leaching.

In view of the advantages of establishing medic pastures on skeletonweed land, the use of picloram on broad acres is inadvisable.

HAZARDS ASSOCIATED WITH THE USE OF PICLORAM FOR SKELETON WEED CONTROL IN THE MURRAY MALLEE

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The Murray Mallee is bordered by the River Murray to the west and north, the Victorian border on the east, and on the south it is approximately separated from the Upper South-east by the road from Tailem Bend to Pinnaroo. Annual rainfall varies from nearly 15 in. (380 mm) in the south to about 10 in. (254 mm) near Loxton. Soils vary from infertile sandy rises to more fertile loamy flats. Skeleton weed is now widespread through the less fertile sandy areas, where pasture growth is generally poor.

EARLY USE OF PICLORAM

Picloram was made available for research purposes in South Australia as a 24% potassium salt formulation during 1963. It was included in a skeleton weed eradication trial at Karoonda in December of that year.

Results were very encouraging and picloram was soon recommended for skeleton weed eradication at 1.0 lb per acre (1.1 kg per hectare). However the extent of the weed throughout the Murray Mallee made its eradication, even at this comparatively low rate, very expensive. Feed produced on treated areas was of poor quality, consisting mainly of brome grass (*Bromus* spp.) silver grass (*Vulpia* spp).

PICLORAM AT LOW RATES

Considerable interest was maintained in picloram because it showed activity on skeleton weed at low rates (e.g. 2.0 oz a.e. per acre or less)(140 gm a.e. per hectare) and broad acre spraying of the weed became a possibility. Rates as low as 1.6 oz per acre (112 gm per hectare) were found to control skeleton weed for 8 months, and further experiments were aimed at pasture establishment on areas where the weed had been controlled by this treatment.

In one such experiment, picloram (potassium salt) was applied in September 1964 at rates from 0.25 to 2.0 oz a.e. per acre (17.5-140 gm a.e. per hectare). The plots were cross sown with pasture legumes in the following autumn, 7 months after spraying. Production cuts and pasture composition estimates from Harbinger medic and Dwalganup subterranean clover indicated that picloram residues reduced the legume component severely, especially above 1 oz picloram rate. When the area was inspected in 1966, the annual legumes still had not established on the picloram plots, despite topdressing with superphosphate and trace elements. This suggested failure in legume seed set on picloram plots.

A similar picture has emerged from experiments during 1968/69. Several picloram formulations, were applied to dense skeleton weed during August and early November 1968. Picloram rates were 0, 0.125, 0.25, 0.50, 0.75, and 1.0 oz a.e. per acre (0, 8.75, 17.5, 35.0, 52.5, and 70.0 gm a.e. per hectare.)

Harbinger medic was sown across the sprayed plots in Autumn, 1969. One month after sowing, the medic was stunted and showed leaf distortion wherever 0.5 oz a.e.per acre (35.0 gm a.e. per hectare) picloram had been applied. Later in the growing season, the Harbinger medic was cut at flowering from picloram treated plots.

The table shows the dry weight of Harbinger medic cut from two 10 sq. link (0.4m2) quadrats at the given picloram rates. Each

figure is the mean of two quadrat cuts.

Variability in pasture growth was very high at the lowest picloram rates (0 - 0.5 oz per acre) (0 - 35.0 gm per hectare) and the effect on skeleton weed density had practically disappeared at those rates. A general downward trend in pasture dry matter production was evident above the 0.5 oz per acre (35.0 gm per hectare) picloram rate. Variability at lower rates was too high to draw any conclusions from the yield figures. Patchy pasture growth was due to factors such as water repellence, sowing unevenness or variable skeleton weed density which occur on larger sites. However, the detrimental effect of picloram residues, both on medic yield and seed set, was clearly evident at the time of sampling.

The pasture yields suggest that the November picloram application was more severe on medic growth than the August treatment at the two highest picloram rates. This is to be expected because more time was available for leaching picloram from the earlier sprayed plots. It is important to note also that 10.6 in. (270 mm) of rain was recorded near the trial site from November - April, and this was approximately 6 in. (154 mm) above the mean for that period. A more serious picloram residue problem would be expected under average rainfall conditions.

At present, the factors effecting the disappearance of picloram from the soil are not well defined. Leaching is likely to be important in sandy soils, but the fate of the leached herbicide requires further study.

From this brief summary it is clear that picloram does not fit into a farm programme to control broad acre infestations of skeleton weed. Even at picloram rates less than 1 oz a.e. per acre (70 gm a.e. per hectare) the weed recovers before useful pasture species can be established. Far more vigorous stands of annual medic have been established where picloram has not been used, and the saving in cost may be channelled towards purchase of more fertilizer and medic seed.

In areas of unreliable rainfall, such as the Murray Mallee, chemicals of a persistent nature, such as picloram, should be used for spot spraying only.

Dry Weight of Harbinger Medic, cut at Flowering (August) Parrakie 1969

Rate of Picloram Applied		lbs Dry Matter/ac		kg Dry Matter/ha	
oz a.e./ac	gm a.e./ha	Block 2	Block 4	Block 2	Block 4
Sprayed August 1968					
0	0	825	880	925	985
0.125	8.75	825	748	925	840
0.25	17.5	286	462	321	518
0.50	35.0	363	385	407	432
0.75	52.5	242	452	272	506
1.00	70.0	154	154	173	173
		Block 1	Block 3	Block 1	Block 3
Sprayed November 1968					
0	0	452	484	506	544
0.125	8.75	835	1275	940	1432
0.25	17.5	540	275	605	308
0.50	35.0	528	143	594	156
0.75	52.5	33	132	37	148
1.00	70.0	22	44	25	49