Crops

Research Note

FODDER BEET TOLERANCE TO LENACIL

MARTIN LANGLANDS, J.H.B. BUTLER and G.A. HURRELL,

Agricultural Research Division, MAF, Lincoln.

SUMMARY

Two trials, on Templeton silt loam and Lismore silt loam showed lenacil pre-plant soil incorporated significantly reduced establishment of fodder beet, and when the crop was late sown, reduced bulb yields.

INTRODUCTION

The use of beet crops for alcohol production has been advocated (Kardos and Mulcock 1977; Dunn *et al* 1978; Anon 1979). The Ministry of Agriculture and Fisheries began an extensive research programme in 1979 on the growing of fodder beet. Establishment of beet crops was often poor in trials and the herbicide lenacil, used according to label recommendation, was suggested as a cause. This research note reports on two trials to test beet tolerance to lenacil, pre-plant soil incorporated.

METHOD

Trials were laid down in 1979 at Templeton on a Templeton silt loam soil and in 1980 at Winchmore on a Lismore stony silt loam. The trial design was a four replicate randomised block with lenacil rates of 0, 0.8, 1.6, 2.4 and 3.2 kg/ha. Plot size was 8-10 x 4m. Treatments were applied in 200 litres/ha at 200 kPa on 29.11.79 and 7.10.80, with a modified Oxford precision sprayer. Immediately after application herbicides were incorporated to 50 mm by dutch harrows.

Fodder beet cv Monoblanc was sown in 0.5 or 0.475 m rows with a Stanhay seeder at 160,000 seeds/ha on 7.12.79 and 8.10.80. Plots were weeded by hand and by mechanical cultivation three times until crop canopy closure. Plant counts at establishment and at harvest and beet yields were recorded in a quadrat 5 x 2m (1979) or 2.5 x 2 m (1980).

RESULTS

Plant numbers at establishment were reduced by 10% for every kg of lenacil applied /ha (Fig. 1). Plant numbers at harvest were reduced, particularly at the lower rates, largely due to accidental plant thinning during hand weeding. Increased rates of lenacil reduced weeds present so that less hand weeding and accidental thinning occurred on high rate plots.

The rate of lenacil affected bulb yields in the same way as it did plant numbers in 1979 and reflected the dominating effect of bulb numbers on final yield of this late sown crop. In 1980 bulb yields were more variable. In addition hand weeding was inadvertently delayed until weeds had influenced plant growth. A further weed strike occurred after final hand weeding.

Control of wireweed (*Polygonum aviculare*) and willow weed (*P. persica*) was not achieved by lenacil below 1.6 kg/ha while fathen (*Chenopodium album*) and white clover (*Trifolium repens*) were only partly controlled at all rates tested.

CONCLUSION

Tolerance of fodder beet to lenacil applied pre-plant soil incorporated was inadequate at the two sites tested. The early trial work in Canterbury with lenacil was

34th Proc. N.Z. Weed and Pest Control Conf.

Crops

Fig. 1: Effect of rates of lenacil on plant numbers and yields of fodder beet at Templeton and Winchmore.

done on Temuka silt loam soil and only a slight yellowing of the plants occurred (Dunn 1969). The establishment problems noted in these trials, together with poor weed control at lower rates made lenacil unattractive as a pre-plant or a pre-emergence treatment (unpublished data) on lighter soils. This shows the need to re-evaluate Cox's (1969) recommendation (now the current European recommendation (Hollowell 1981)) of using lenacil as a post-emergence residual treatment in combination with phenmedipham if it is to be used in beet crops.

REFERENCES

- Anon, 1979. The potential of energy farming for transport fuels in New Zealand. *N.Z. Energy Research and Development Committee Report No. 46*: 131 pp.
- Cox, T.I., 1969. Herbicides for horticultural beet crops. *Proc. 22nd N.Z. Weed and Pest Control Conf.*: 79-87.
- Dunn, J.S., 1969. Experience with selective herbicides when developing complete mechanisation for growing fodder beet. *Proc. 22nd N.Z. Weed and Pest Control Conf.*: 61-67.
- Dunn, J.S., Henderson, C.F., Painter, D.J., Steele, P.E. and Young, R.J., 1978. Ethanol produced from fodder beet. *N.Z. Agricultural Engineering Institute, Internal Report No. 95 (unpublished)*. 11 pp.
- Hollowell, B., 1981. Venzar post emergence for best results. *British Sugar Beet Review* 48 (4): 35-36.
- Kardos, N. and Mulcock, A.P., 1977. Ethanol from agricultural crops. *N.Z. Energy Research and Development Committee Report No. 28*: 38 pp.