BENEFIN AND PEBULATE: WEED CONTROL IN TRANSPLANTED TOBACCO

R. TAYLOR

I.C.I. (N.Z) Ltd., Christchurch

Summary

A trial was laid down to compare benefin at three rates (0.75, 1.5 and 3.0 lb/acre) with pebulate (4.0 lb/acre) and normal mechanical methods for weed control in transplanted tobacco: interim results of the effects of the herbicides on weeds and tobacco are given. The fresh weight of weeds decreased with increases in the rate of benefin: pebulate at 4.0 lb gave results similar to benefin at 1.5 lb. There were no apparent differences in growth or quality of tobacco between any of the treatments up to the time of picking.

INTRODUCTION

BENEFIN is widely used overseas for controlling weeds in transplanted tobacco (see, for example, Doyle, 1968). Klingman (1967) compared a number of herbicides and reported good weed control and adequate crop tolerance with benefin and pebulate. These herbicides were shown to have no significant effect on the chemical constituents in tobacco leaves. The present paper reports preliminary results of a trial comparing conventional mechanical and hand-weeding methods of weed control with herbicide treatments. The Tobacco Research Station has harvested tobacco leaves for measurement of yield and quality: detailed results will therefore be published later.

Rates of herbicide application are given in lb active ingredient per acre.

METHODS

The trial was laid down on a Riwaka sandy loam soil. Five treatments for weed control were compared:

1. Normal inter-row cultivation and hand-weeding.
2. Benefin 0.75 lb applied before planting.
3. Benefin 1.5 lb applied before planting.
4. Benefin 3.0 lb applied before planting.
5. Pebulate 4.0 lb applied before planting.

Following normal seedbed preparation and insecticide application, the herbicides were applied in 25 gal/acre by a tractor-mounted boom and immediately rotavated to a depth of about 3 in. Before planting, the trial area was levelled by harrowing.

In Treatment 1, each plot comprised five rows of tobacco, 60 ft long: herbicide treatments were applied to plots comprising three rows. Tobacco (variety Hicks) was transplanted on November 18, 1968, with plants 17 in.

apart in rows 46 in. apart: fertilizer was applied at planting. After planting all plots were shallow cultivated between the rows to remove wheel-marks.

Weeds in the control plots (Treatment 1) were removed by inter-row cultivation and hand-weeding according to the grower's normal practice. On January 16, 1969, the weeds in the herbicide treatments were hand-pulled from an area 60 ft $\times$ 7 ft 8 in. (two row widths) and each of the main plant species weighed.

RESULTS AND DISCUSSION

Cultivation and hand-weeding effectively controlled all the weeds germinating in Treatment 1 and caused no apparent damage to tobacco leaves.

Four main weeds, black nightshade (*Solanum nigrum*), yellow weed (*Galinsoga parviflora*), redroot (*Amaranthus* spp.) and willow weed (*Polygonum persicaria*), were present in all herbicide treatments at the time of weeding on January 16, 1969: the fresh weight yields per plot (60 ft $\times$ 7 ft 8 in.) are given in Table 1. The total yield of the four weeds decreased significantly with increases in the rate of benefin; the value for pebulate (4.0 lb) was similar to that for benefin at the intermediate rate (1.5 lb). Control of black nightshade with pebulate was significantly less effective than benefin at 1.5 and 3.0 lb. Yellow weed, redroot and willow weed germinated in irregular patches over the trial area giving a high statistical error. However, while firm conclusions cannot be drawn, the results suggest that pebulate (4.0 lb) and benefin at the higher rates (1.5 and 3.0 lb) will give reasonable control of yellow weed, redroot and willow weed. It was observed that the root growth of some of the resistant plants, particularly redroot, was restricted by benefin treatment at the lowest rate. During January, February and March, when the tobacco was harvested, the trial area remained relatively free of weeds. After harvesting, the soil was rotary-hoed, surface cultivated and H1 short-rotation ryegrass sown early in April; ryegrass germination and early growth has been reduced where benefin was applied at 3.0 lb before transplanting.

TABLE 1: FRESHWEIGHT YIELD OF FOUR WEEDS RESISTANT TO BENEFIN APPLIED AT DIFFERENT RATES AND PEBULATE

Treatment (lb)	Black Nightshade	Freshweight yield per plot ($\times$ 250 g)			
		Yellow Weed	Redroot	Willow Weed	Total
benefin 0.75	9.5 abAB	1.0	26.1	30.2	66.8 aA
benefin 1.50	5.6 bcB	1.7	2.7	7.1	17.1 bB
benefin 3.0	2.7 cB	1.5	0.6	0.9	5.7 cC
pebulate 4.0	13.9 aA	0.1	3.6	1.0	18.6 bB
CV	36.3%				6.1%

ACKNOWLEDGEMENTS

The author wishes to thank R. W. James, Superintendent, Tobacco Research Station, DSIR, for permission to report these interim results and P. H. Malham for local supervision of the trial and the associated field

work. The growers, Stevens, Riwaka Ltd., provided the site and co-operated fully throughout the trial.

REFERENCES

- Doyle, A. D., 1968: *N.S.W. Agric. Gazette*, Aug.: 456.
Klingman, G. C., 1967: *Tobacco Sci.*, Sep.: 115.