Field Testing of a Turnip Growing Protocol on New Zealand Dairy Farms

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Introduction Summer droughts are a regular occurrence in central North Island districts of New Zealand, which causes pastures to wilt, lose their nutritive value and stop growing. The resulting summer feed gap depresses farm productivity (Clark *et al.,* 1996). Turnips optimally sown mid-late October (more often sown in November or even December) are grown to fill this feed gap. Recorded average yields of 7.4 t dry matter (DM)/ha are below the economic breakeven point of 8-10 t DM/ha (Clark *et al.,* 1996). A turnip growing protocol was developed from published data (Eerens & Lane 2004) and tested on commercial dairy farms.

Material and methods Dairy farmers who intended to grow a turnip crop were provided with a copy of the protocol in the 2002/03 and 2003/04 growing seasons. The protocol covered pre sowing paddock and seedbed preparation, target early sowing date (middle of October), timing and frequency of herbicide and insecticide application, target soil pH levels and fertiliser inputs. One hundred and eighty eight paddocks in the central North Island were assessed. Data were obtained on a variety of crop management and environmental factors. Thirty-five dairy farmers (19%) returned complete information. Turnip yields were assessed 90 days after sowing (from late January onwards) on a single representative 6 m^2 area. In the field, leaf and bulb material were separated and weighed, leaf material was cut off at around 1 cm above the neck of the bulb. The weighed samples were oven dried for 24 hours at 85°C to determine DM yields. Most of the crops were of the turnip variety Barkant, with some of the cultivar Green Globe.

Results The data reported here were not generated from controlled experiments and replication was unbalanced. The crops were grown as part of commercial operations and business considerations determined the need for action. For many factors all farmers did the same, resulting in a lack of contrast between treatments for those factors and an inability to comment on their impact. Variation was observed in post-emergence herbicide and insecticide application timing, ranging from within 14 (pre-emptive) to up to 60 (reactive) days later than what the protocol prescribed. This was the only factor on which the protocol could be tested. Total turnip (leaf and bulb) and leaf yields are given in Table 1. In one instance the yield was less than 10 t DM/ha when the protocol was followed but in more than 60% of the cases yields exceeded 12 t DM/ha. Where the protocol was not followed, the yield was under 10 t DM/ha in 33% of the cases and in excess of 12 t DM/ha only in 22% of the cases.

Table 1 Total dry matter (DM) and leaf DM yields achieved when applying post-emergence herbicide and insecticide either in accordance (n=13) with the protocol or not (n=22)

	Followed protocol		SED
	Yes	No	
Total yield (t DM/ha)	12.5	10.9	0.513
Leaf yield (t DM/ha)	8.1	6.8	0.403
Leaf:Bulb ratio	1.87	1.71	0.145

Conclusions Pre-emptive post-emergence herbicide and insecticide application, appears to lead to increased crop yields. However, similar high yields were achieved in the absence of either spray which points to variation in farmer cropping experience and variation in local weed and pest loadings. Crops are generally used to break disease cycles and improve poor and generally weedy paddocks, implying a need for weed and pest control.

References

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