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Plant & Food
RESEARCH

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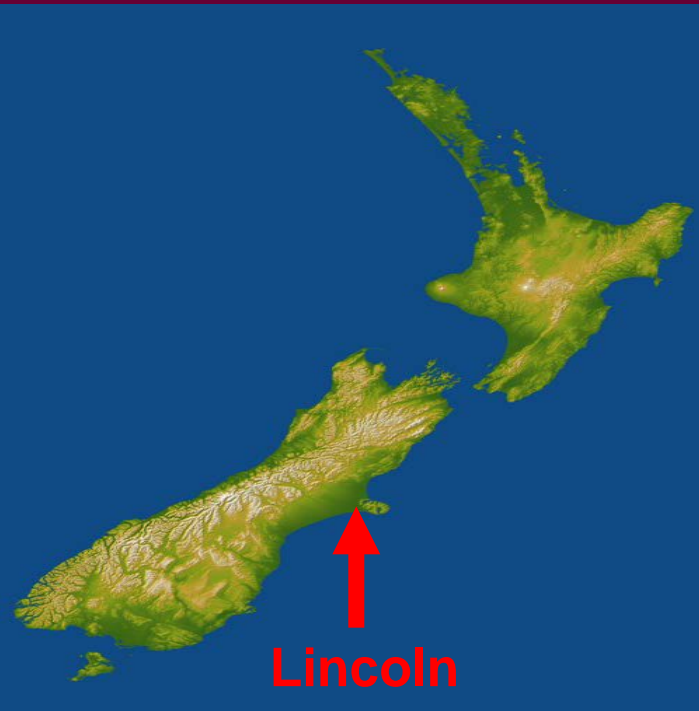


Nitrate–nitrogen accumulation in forage kale grown under shallow soils.

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Background---



➤ Averages forage kale DM yields in Canterbury:

- 6-13 t DM/ha for rain fed &
- 14-25 t DM/ha for irrigated crops

- Kale takes up large amounts N.
- Excess N is stored as NO_3^- - N



Nitrogen effects



- Excess NO_3^- - N result in:
Poor performance of animals,
and in extreme cases-----
- Death of grazing ruminants.

Threshold NO_3^- -N concentrations (mg/g) for animal feed:

- ≤ 0.35 = safe for all conditions & livestock classes,
- $0.35-1.13$ = safe for non-pregnant livestock
- ≥ 1.13 = not recommended for feeding any livestock classes.

• Total DM yield & weighted NO₃-N concentration

Treatments		Whole crop	
<u>Water</u>	<u>N (kg/ha)</u>	<u>DM (t/ha)</u>	<u>NO₃-N (mg/g)</u>
Irrigated	0	10.1	0.03
	75	10.9	0.05
	150	15.9	0.04
	300	25.8	0.65
Rain-fed	0	5.2	0.04
	75	6.4	0.10
	150	10.9	1.52
	300	11.3	4.63
Significance			
W		*	*
N		*	*
W*N		ns	ns