

168. Which land uses should be included the proposed Rule 13-1 was an issue of contention identified through the hearing

- The inclusion of irrigated sheep and beef farms was questioned by Federated Farmers (Tessa Mills, para. 19.4). Clothier *et al.* (2007) (Table 8 above) identified likely losses from sheep and beef farms to be 6 to 60 Kg N/ha/yr. Dr Roygard (para. 308) identified that the provision of irrigation on farms increases the risk of contaminant losses from these farms. Dr Clothier (paras 49-51) presents some modelling scenarios that show relative losses under different irrigation scenarios. In these scenarios it was shown that:

- normal irrigation resulted in a reduction of nitrate leaching; and
- excessive irrigation significantly increased losses.

However, in this modelling, the scenarios did not adjust fertiliser use or stocking rate, and the reality is that land is irrigated to increase production – whether that is crop, milk or meat. Dr Mackay, in his End of Hearing Report, shows that increased irrigation is generally accompanied by increased fertiliser use and stocking rate. A comparison of irrigated and non-irrigated blocks of the Farmer Applied Resource Management Strategy (FARMS) test farms showed N-loss off the irrigated blocks was greater than the non-irrigated blocks (Table 9), despite fertiliser nitrogen inputs to the respective blocks being the same. The one exception was one block that was cropped where the nitrogen removed was considerably more off the irrigated block. It is concluded that irrigation is a good indicator of intensification of sheep and beef farming.

**Table 9:** Comparison of nitrogen leached off non-irrigated and irrigated farm blocks.

Farm	Soil type	Non-irrigated N-loss (kg N/ha/yr)	Irrigated N-loss (kg N/ha/yr)	% increase(+) % decrease(-)
Oringi – irrigated sheep/beef		12	15	+25
Johnston – dairy	Pukepuke	20	25	+25
	Waitarere	30	38	+27
	Himatangi	29	36	+24
Whirokino – dairy	Pukepuke medium	10	22	+120
	Pukepuke heavy*	19	13	-32
	Waitarere	10	18	+80