



Urine N loading is lower from cows grazing plantain

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	Ryegrass- white clover	50% Plantain	100% Plantain
Autumn			
Urine N (g N/L)*	5.4	3.6	2.4
Urine volume (L/cow/day)	46	59	74
Urine patch load (kg N/ha)	698	579	450
Spring			
Urine N (g N/L)*	4.7	3.4	2.2
Urine volume (L/cow/day)	44	34	54
Urine patch load (kg N/ha)	666	503	321

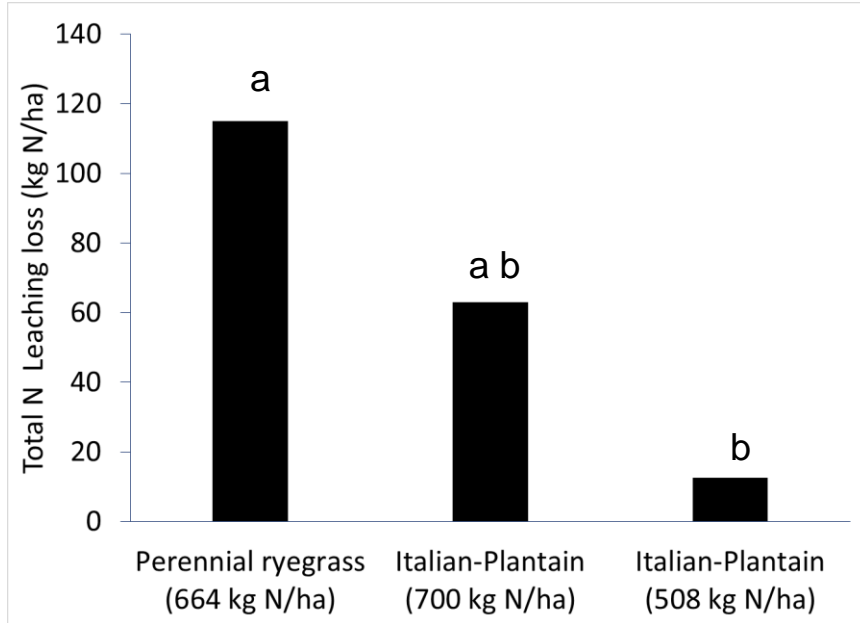
*spot samples

Box et al. 2017, NZJAR, Box et al. 2016 Proc NZSAP

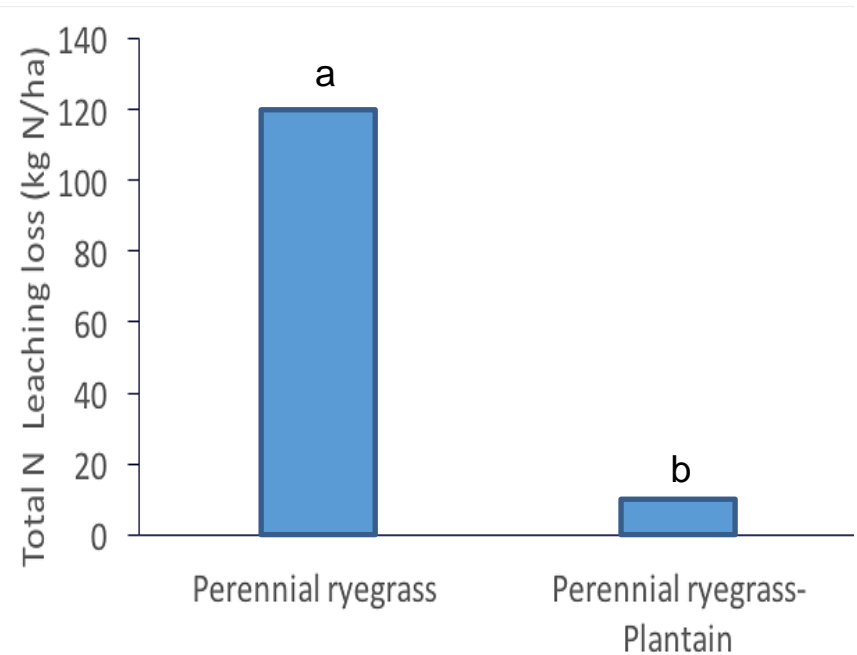


Reduced leaching from Italian ryegrass & plantain partly due to better plant N uptake, lower urinary N load from animals and an effect on soil?

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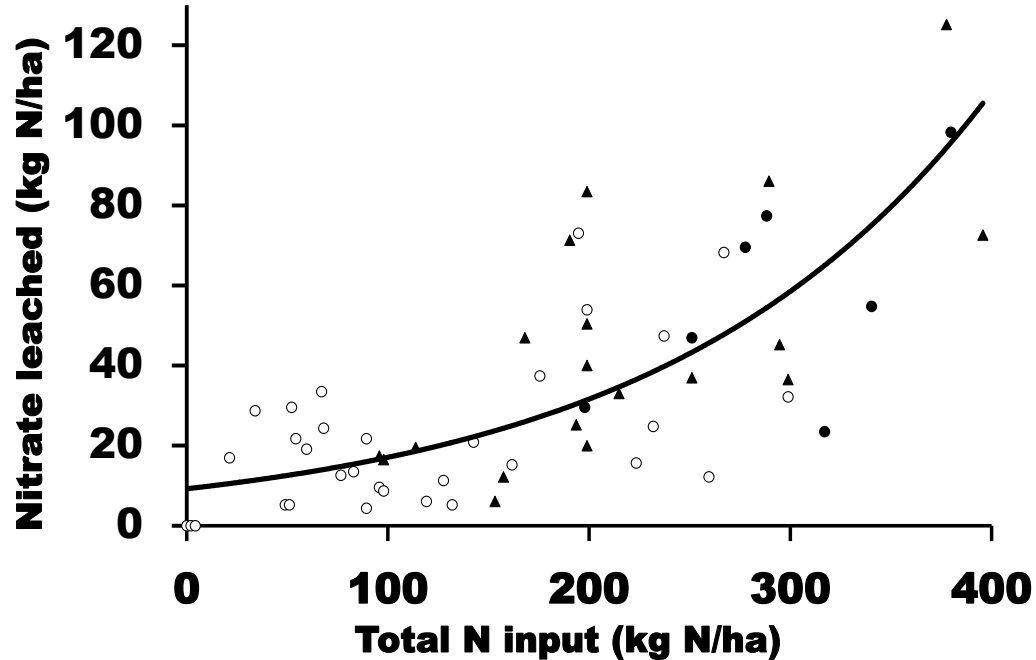
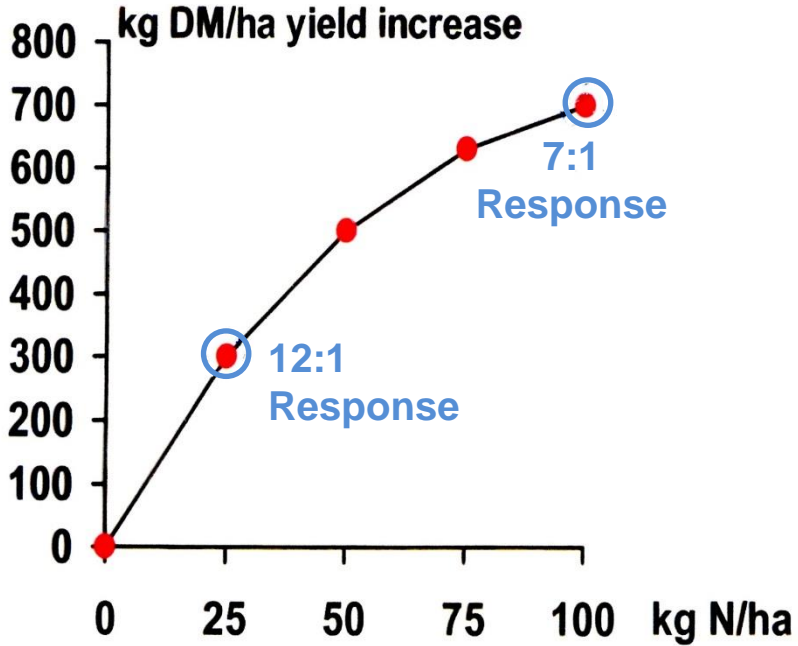
Woods et al. 2018



Carlton et al. (2018)



Increase N use efficiency by using optimum rates of N fertiliser



(Ledgard *et al.*, 2009; Cameron *et al.* 2013)