



Reducing Nitrogen Emissions on Grassland Farms

Protected Urea



Low Emission Slurry Spreading

*Mark Plunkett, Teagasc,
Johnstown Castle, Wexford*



Sources of N

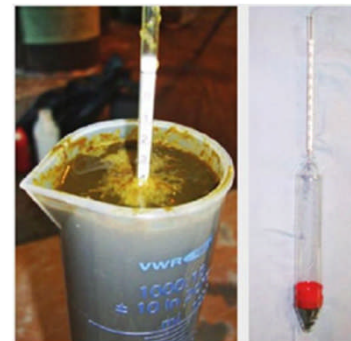
Organic Manures



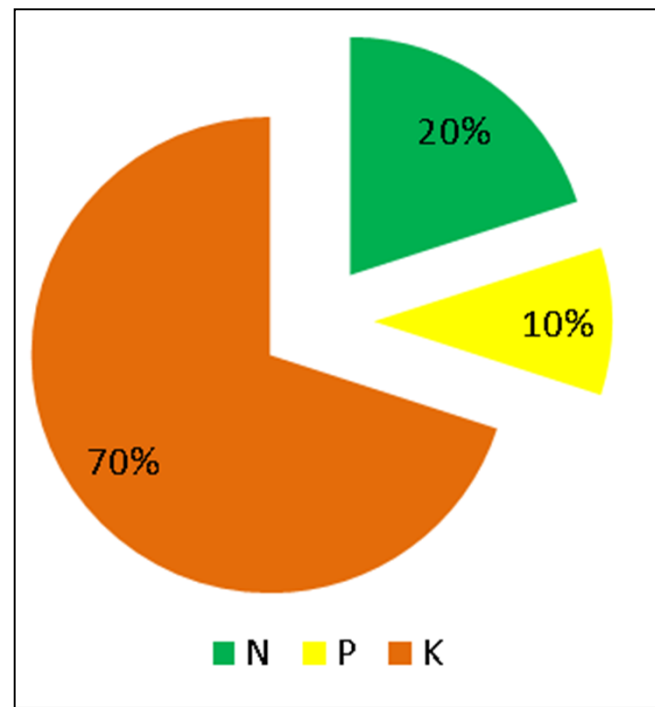
Fertiliser N



What's in Cattle Slurry?



Nutrient	Kg/m ³
N	1.0
P	0.5
K	3.5
S	0.3
Mg	0.4
DM %	6.3%



Where to Apply Cattle Slurry?



Soil Analysis



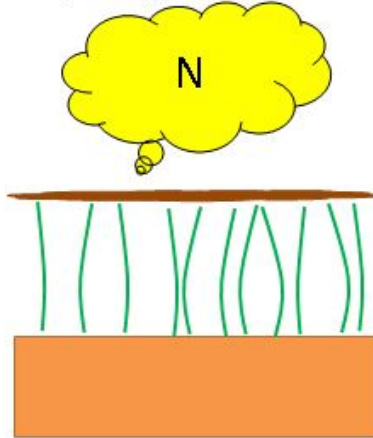
Crop Demand
(N, P & K)



Which Method of Application?

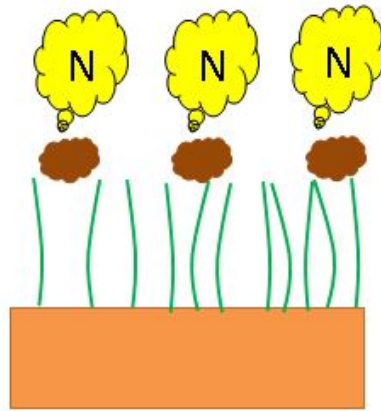


	Spring	Summer
Units N/1000 gal	6	3



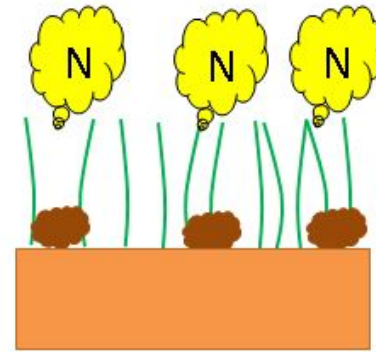
Splash-plate

	Spring	Summer
Units N/1000 gal	9	6



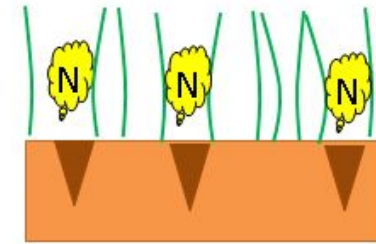
Dribble bar

	Spring	Summer
Units N/1000 gal	9	6



Trailing shoe

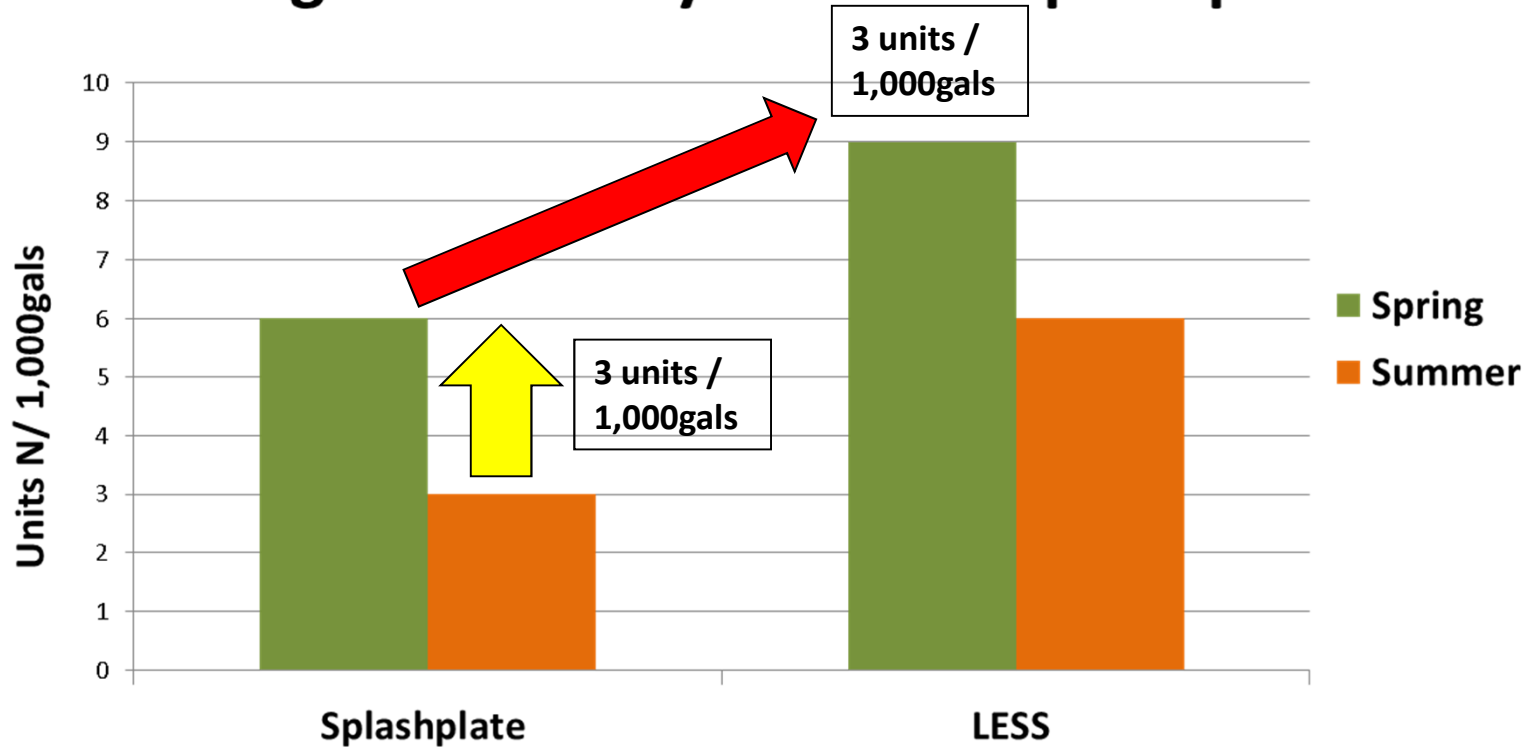
	Spring	Summer
Units N/1000 gal	11	8



Injection

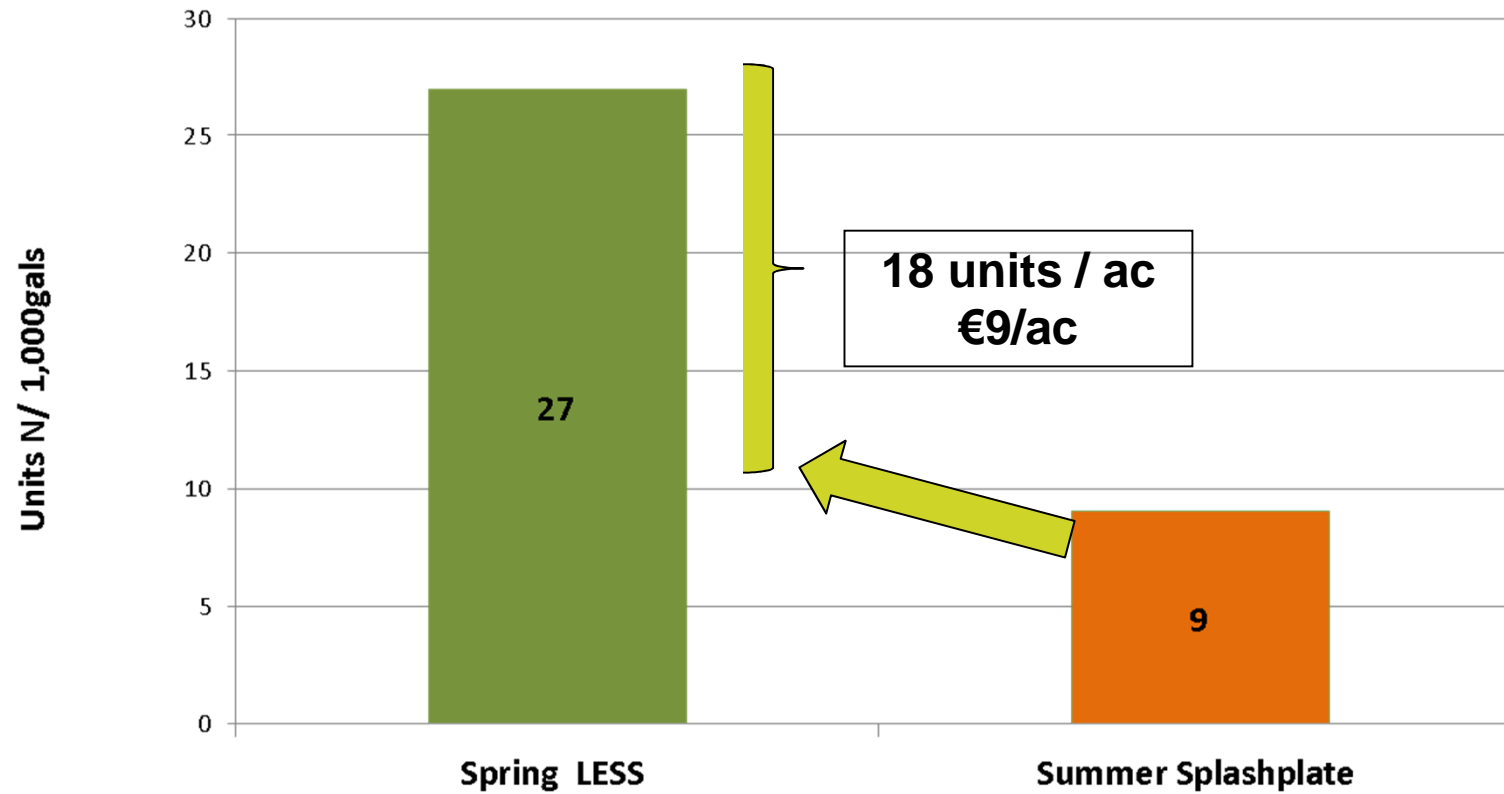
When & How to Apply?

Nitrogen Recovery - LESS 'v' Splashplate


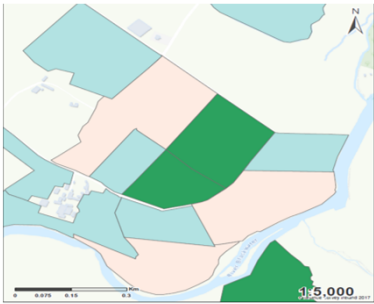








LESS 'v Splashplate

Cattle slurry applied at 3,000 gal/ac



In Summary – Slurry Questions to Ask?

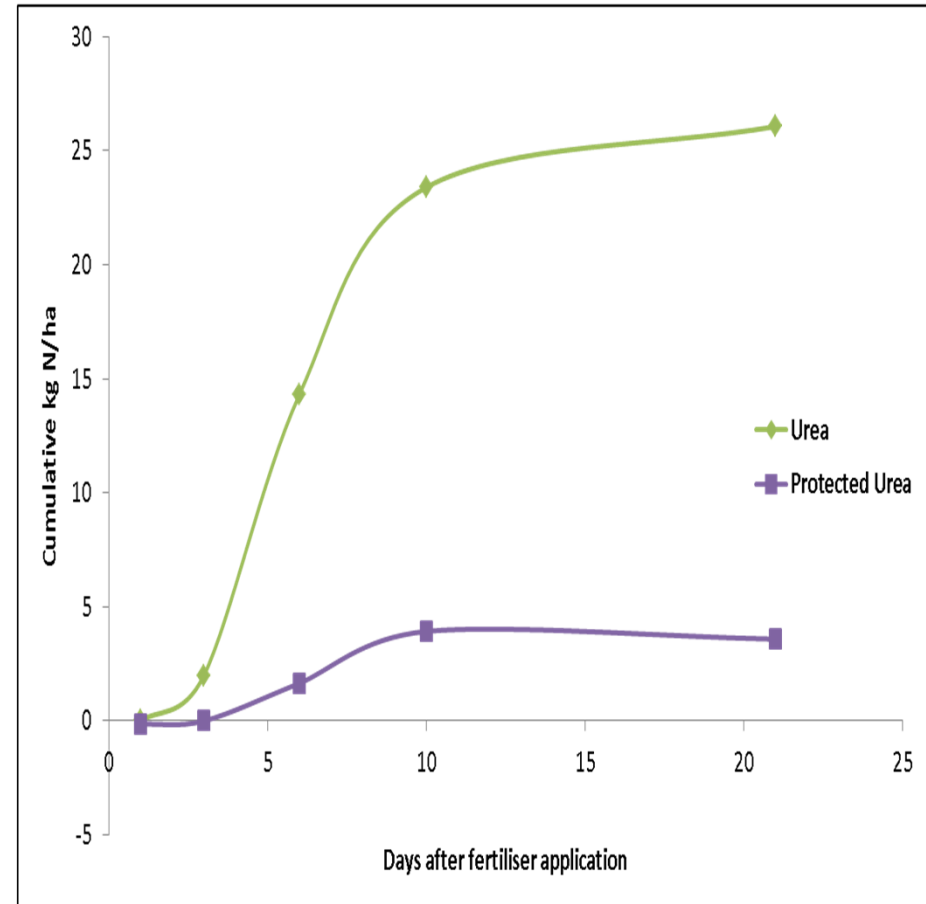
Where ?	When ?	How ?	Rate?
  <ul style="list-style-type: none"> • Fields with large requirements 	<p>cloudy</p>  <p>sunny</p>  <ul style="list-style-type: none"> • Cool, Damp Conditions • Spring better than summer 	 	 

Protected Urea

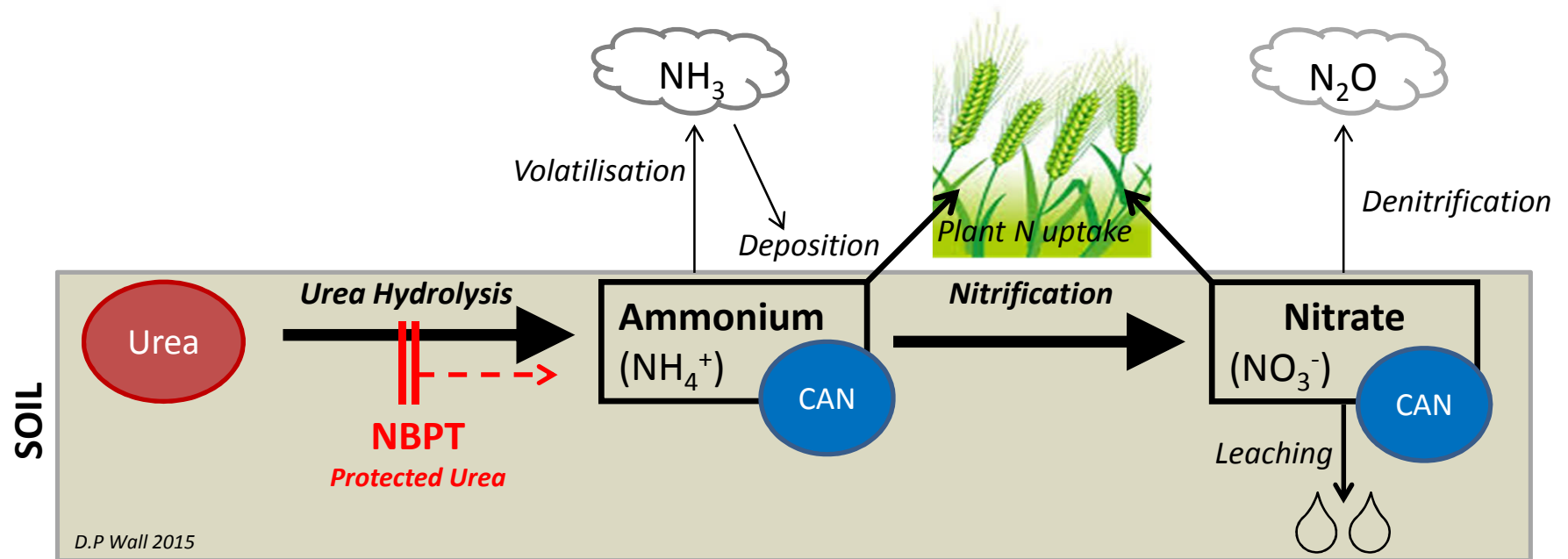


What is Protected Urea?

1. Urea + Urease Inhibitor
2. Reduces Ammonia Loss
3. Increases the recovery of N from Urea

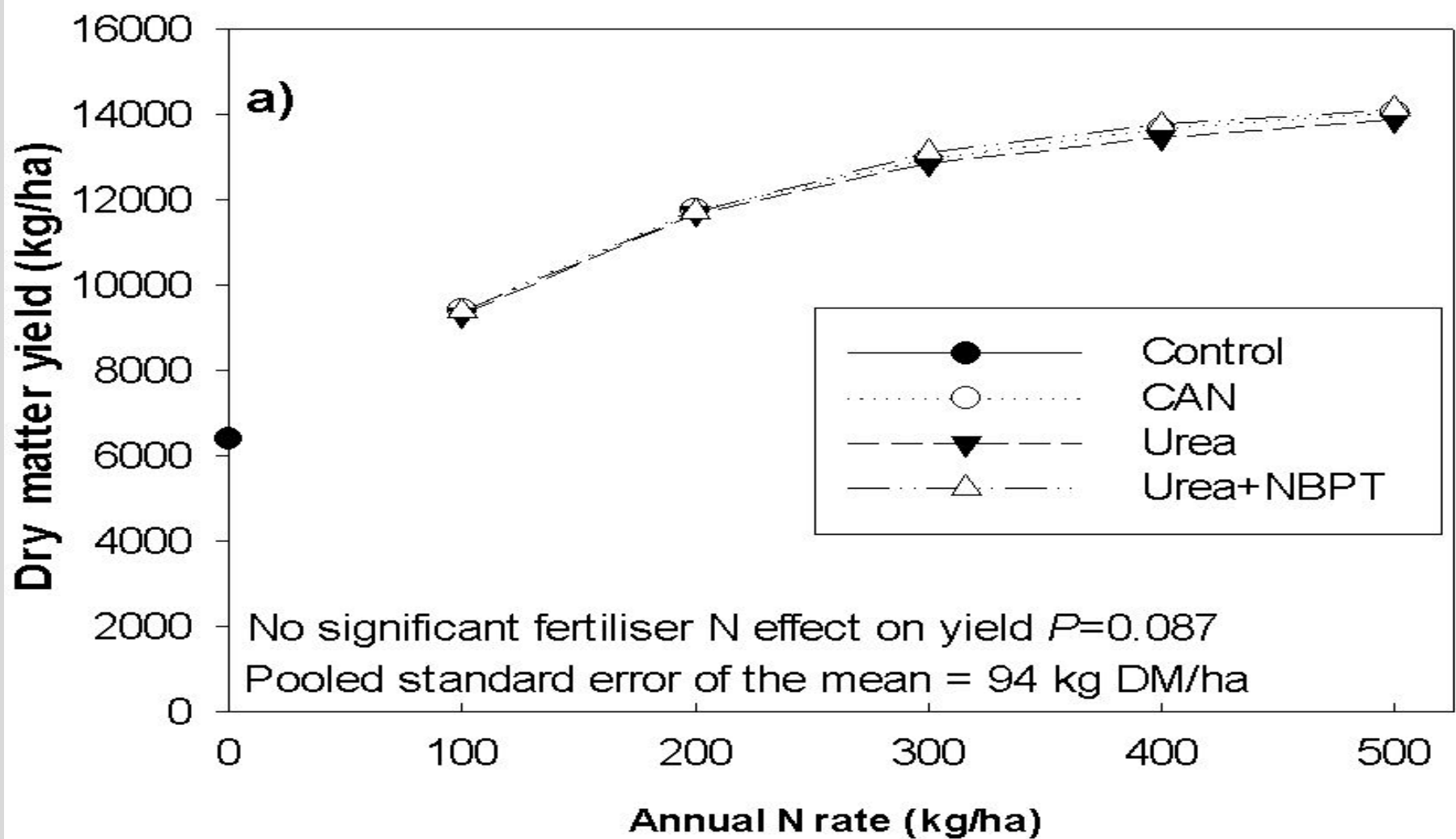


Nitrogen Forms, Loss Pathways & Plant Uptake



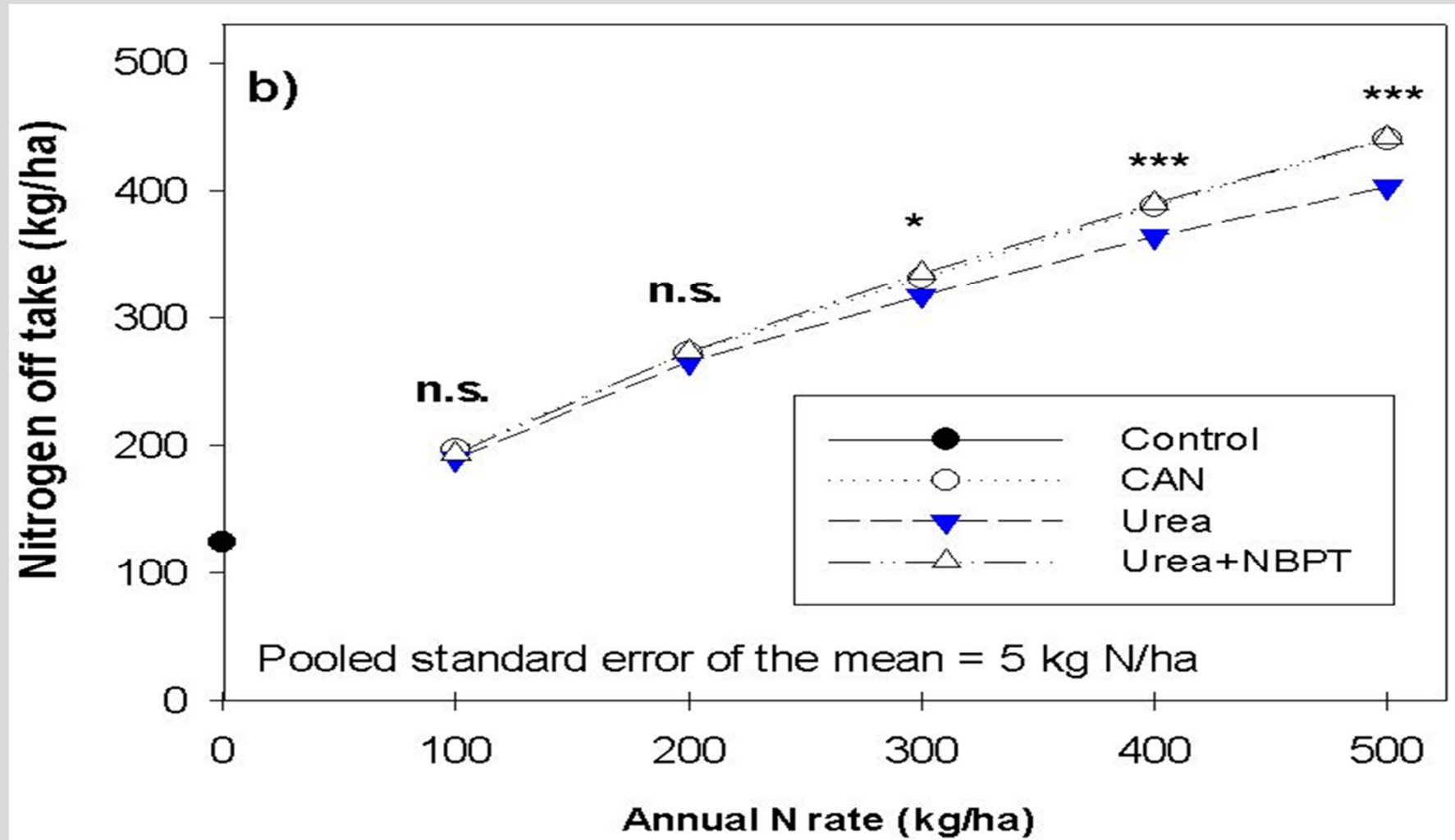
Yield? CAN, Urea, Urea+NBPT

Six site-years 30 N applications



Forrestal *et al.* (2017) *Soil Use & Management* 33: 243-251

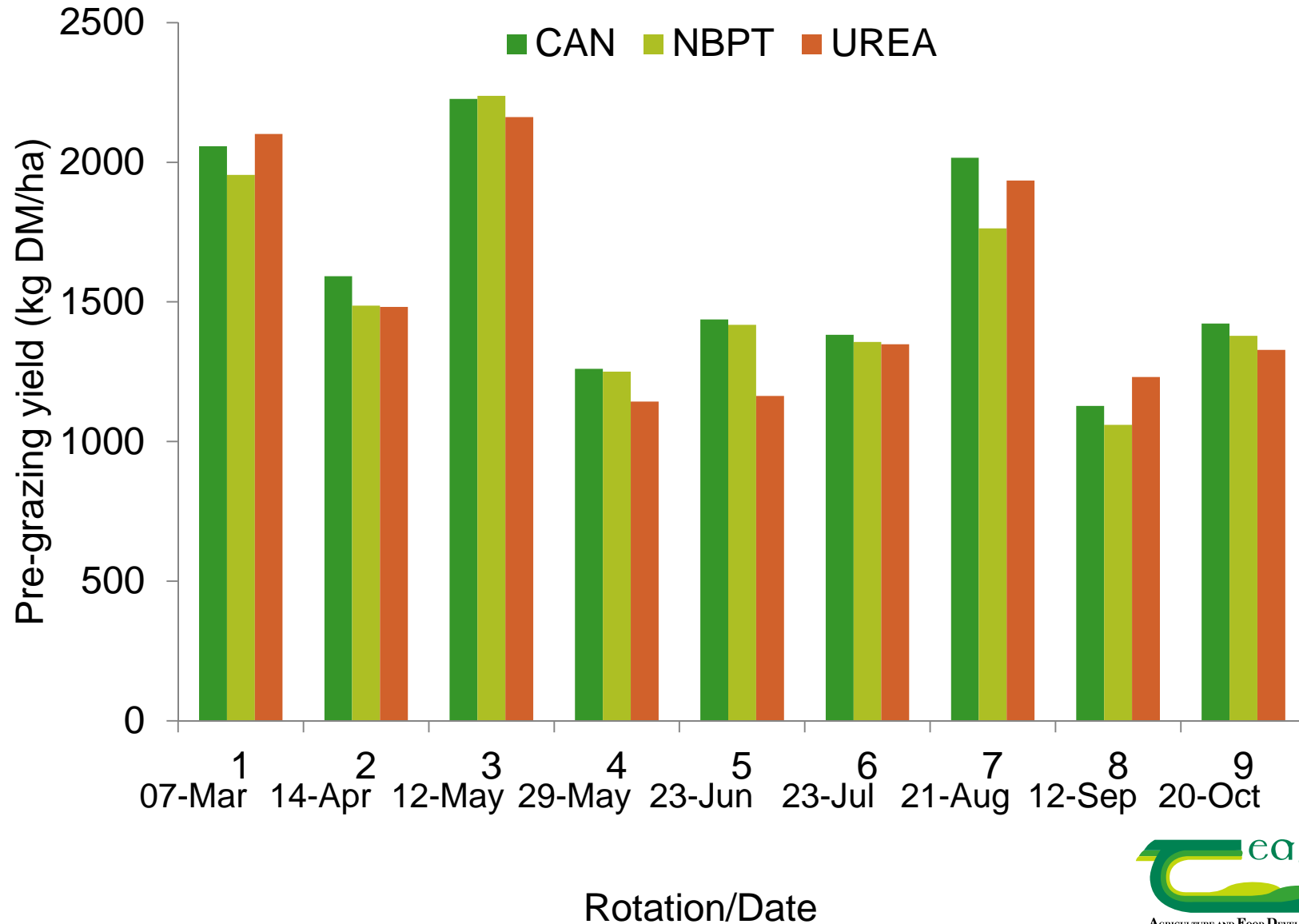
N recovery efficiency? CAN vs Urea vs Urea+NBPT



Forrestal *et al.* (2017) *Soil Use & Management* 33: 243-251

Grass yield: Grazing

1 year × 9 applications × 2 sites × 2 N rates



Sustainable Fertiliser N Products

Company	Product Name	Inhibitor Type	N%	P %	K%	S%
Grassland Fertilisers (Kilkenny) IFI	Topper N Protect	NBPT	46			
	Super Topper N Protect	NBPT	38			7.5
Grassland Agro	Eco Urea	NBPT	46	-	-	-
	Eco N 38	NBPT	38	-	-	7.6
	Eco 29-0-14 +S	NBPT	29	-	14	2
	Alzon Neo-N	2-NPT + MPA	46	-	-	-
	Alzon Neo-N + S	2-NPT + MPA	40			6
Goulding Fertiliser	KaN	NBPT	46	-	-	-
	KaN + S	NBPT	38	-	-	7
	KaN + S	NBPT	35	-	-	10
	KaN + K +S	NBPT	29		14	3.5
Target Fertilisers	UreaMax	NBPT	46	-	-	-
	UreaMax + S	NBPT	40	-	-	6
Yara	Yara Vera AMIPLUS	NBPT	46	-	-	-

Fertiliser Programme & Protected Urea

SR 131 – 170 kg Org N/ha (P & K Index 1)*

Advice		Feb	March	April	May	June / July	Sept	Total
Product (units/ac)		0.5 bag/ac Urea	1.5 bag/ac 18-6-12 + S	0.75 bag/ac Urea	1.5 bag /ac18's S	1.2 bags/ac 18's	0.5 bags /ac bag Urea	
N Splits		23	27	35	27	27	23	
N	162	23	27	35	27	23	23	158
P	25		9		9	7		25
K	72		18		18	14		50
S	6-12		4.5		4.5	3.5		12