



FERTILISER TREATMENT

Why cover yourself against nitrogen loss?

Urea is one of the most common forms of nitrogen fertiliser used on our farms. While broadcast urea promotes rapid plant growth, under certain conditions significant nitrogen losses from ammonia volatilisation (loss of ammonia gas to the atmosphere) can occur. This can reduce the plant nitrogen response efficacy to urea and impact on farm productivity.

Conditions that favour volatilisation

Ammonia losses from urea can be significant within 24 hours of application if there is less than 10 mm of rainfall. The longer it takes to rain, the larger the loss. Researched estimates of ammonia loss following applications of urea to pasture have been shown to vary between 10 and 30% of N applied.^{1,2,3,4} Under more adverse conditions (Eg moist soil, no rain for several days following application, poor canopy cover) higher ammonia losses have been observed.

Nitrain™ helps protect your nitrogen investment

Nitrain is a urea granule impregnated with a urease inhibitor to protect it from ammonia volatilisation. This ensures more nitrogen reaches the root zone to be available for plant uptake, which increases nitrogen use efficiency to support the growth of more pasture or crop.

When would I use Nitrain?

Consider using Nitrain in any situation where you would normally apply urea. Key factors that would influence its use in a pasture or cropping situation:

- Less than optimal conditions at timing of application
 - > 10 mm of rainfall is not guaranteed within 24 hours of spreading
 - > Low pasture or crop cover
 - > Moist soil
 - > Windy weather
- Where high rates of nitrogen are being broadcast
- High pH soils, or soils with low CEC and organic matter levels

Using Nitrain instead of urea offers greater application flexibility as Nitrain reduces the chance of ammonia loss if rainfall is delayed – an added convenience if booking a spreader truck, aerial applicator or applying the fertiliser yourself.

1 Vallis I, Harper LA, Catchpoole VR, Weier KL (1982) Volatilization of ammonia from urine patches in a subtropical pasture. *Australian Journal of Agricultural Research* 33, 97–107.

2 Harper LA, Catchpoole VR, Vallis I (1983) Ammonia loss from fertilizer applied to tropical pastures. In 'Gaseous loss of nitrogen from plant–soil systems'. (Eds JR Freney, JR Simpson) pp. 195–214. (Martinus Nijhoff/Dr W Junk Publishers: The Hague, The Netherlands)

3 Whitehead DC (1995) 'Grassland nitrogen.' (CAB International: Wallingford, UK)

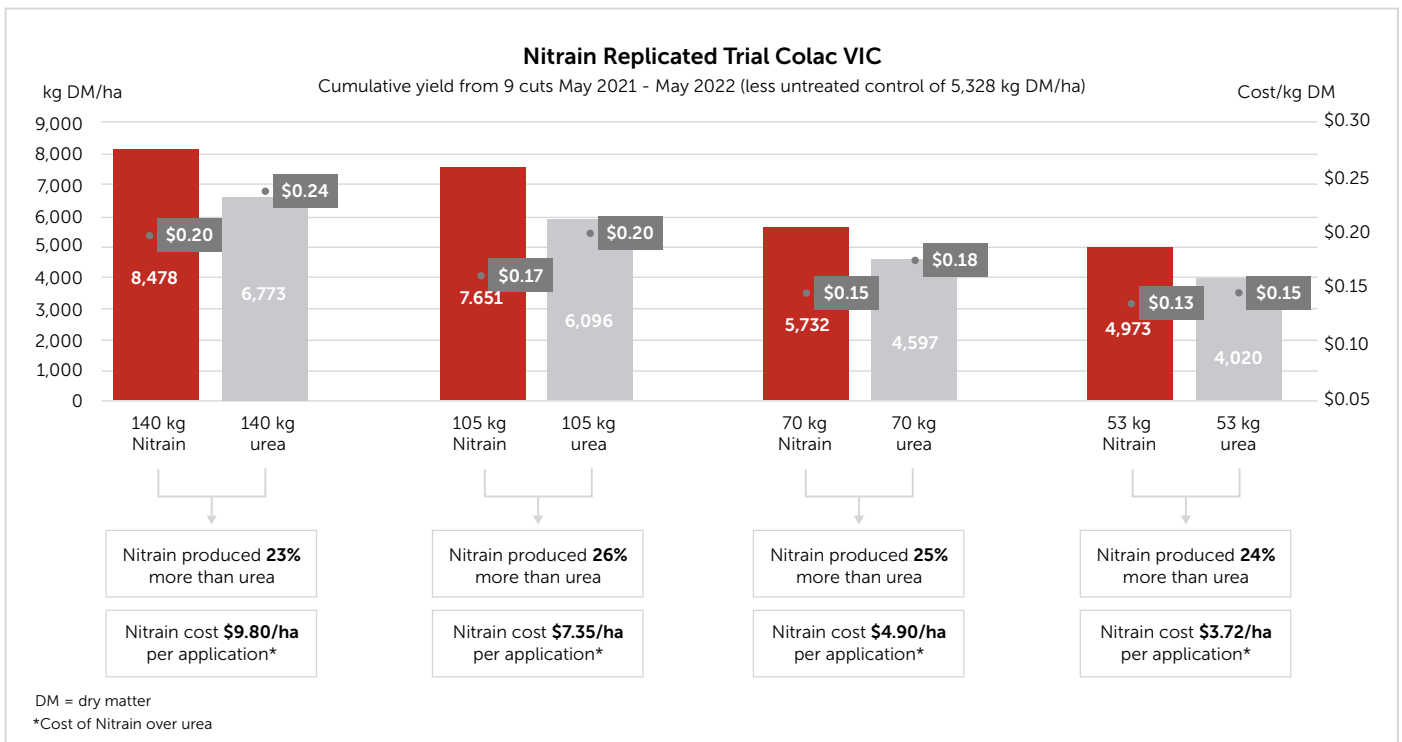
4 Prasertsak P, Freney JR, Denmead OT, Saffigna PG, Prove BG (2001) Significance of gaseous nitrogen loss from a tropical dairy pasture fertilized with urea. *Australian Journal of Experimental Agriculture* 41, 625–632.



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Nitrain™ outperforms Urea in Western Victoria

In a replicated trial near Colac in Western VIC in 2021, Nitrain was broadcast to ryegrass based pasture and compared to broadcast urea. Four rates of fertiliser were evaluated over 12 months with dry matter cuts taken every 40 days to simulate one grazing rotation. The trial demonstrated Nitrain provided higher nitrogen use efficiency than straight urea, resulting in a higher pasture growth rate trend per rotation and total overall yield.



Treatment per rotation	Cumulative yield (kg DM/ha)	DM less control (kg DM/ha)	Cumulative urea applied (kg Fert/ha)	Cumulative N applied (kg N/ha)	DM grown per unit of N (kg/ha)	DM grown per unit of N as Nitrain vs urea (%)	Kilogram of N per day	Cumulative cost per Ha	Cost per Kilogram of DM
140kg Nitrain	13,806	8,478	1,260	580	14.6	25%	1.8	\$1,726.20	\$0.20
140kg Urea	12,101	6,773			11.7		1.8	\$1,638.00	\$0.24
105kg Nitrain	12,979	7,651	945	435	17.6	26%	1.3	\$1,294.65	\$0.17
105kg Urea	11,424	6,096			14.0		1.3	\$1,228.50	\$0.20
70kg Nitrain	11,060	5,732	630	290	19.8	25%	0.9	\$863.10	\$0.15
70kg Urea	9,924	4,597			15.9		0.9	\$819.00	\$0.18
53kg Nitrain	10,300	4,973	477	219	22.7	24%	0.7	\$653.49	\$0.13
53kg Urea	9,347	4,020			18.3		0.7	\$620.10	\$0.15
Control	5,328	-	-	-	-	-	-	-	-

Cumulative dry matter totals from 9 cuts May 2021 to May 2022. Untreated Control (5,328kg) removed to demonstrate net dry matter (DM) produced from applied nitrogen only. Calculations based on urea priced at \$1,300.00/tonne. Independent and fully replicated trial conducted by Pasture First Ltd.

The bottom line

Trials have shown that Nitrain performs more efficiently than urea with savings to be made from reduced nitrogen loss and environmental impact, plus the benefit of producing more pasture or crop per kilogram of applied nitrogen - this can result in more milk, increased live weights and higher crop yields on your farm.

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