

Protected urea – effects on pasture production and emissions mitigation

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National Dairy Conference 2024

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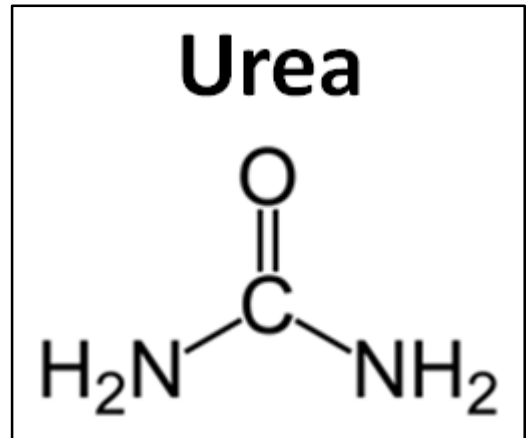
To be covered

Protected urea

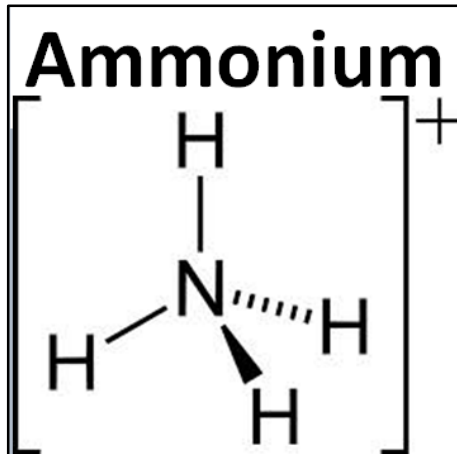
- Forms of N
- What is the protection?
- What does it do?
- Emissions mitigation
- Farm example
- Herbage yield performance
- What's new?



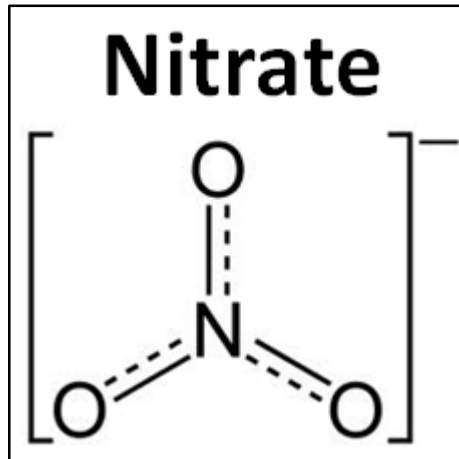
Fertiliser N forms



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What is the protection and what does it do?

- **NBPT** off patent
e.g. Agrotain™, Nitroshield™, Glaze Extend™, N Protect™, others and growing as off patent
- **NBPT+NPPT** 3:1 Limus™ - highest no. blenders with this
Available for solid and liquid fertilisers
- **2-NPT** SKW, Germany



What does the protection do?

- Protects urea from losing nitrogen as ammonia gas
- The more ammonia-N loss on the farm less N to grow grass – ammonia loss effectively eats into your N allowance

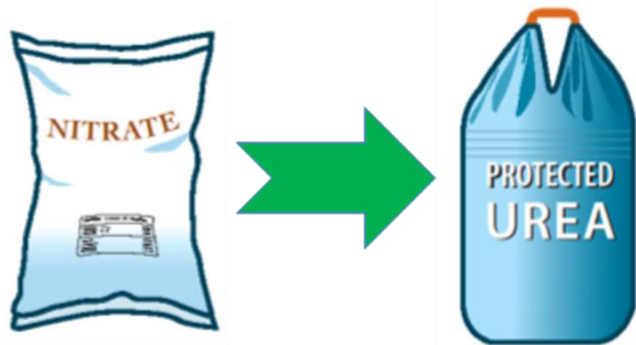


Making the switch to protected urea

A farm example of reduced emissions

Farm Example

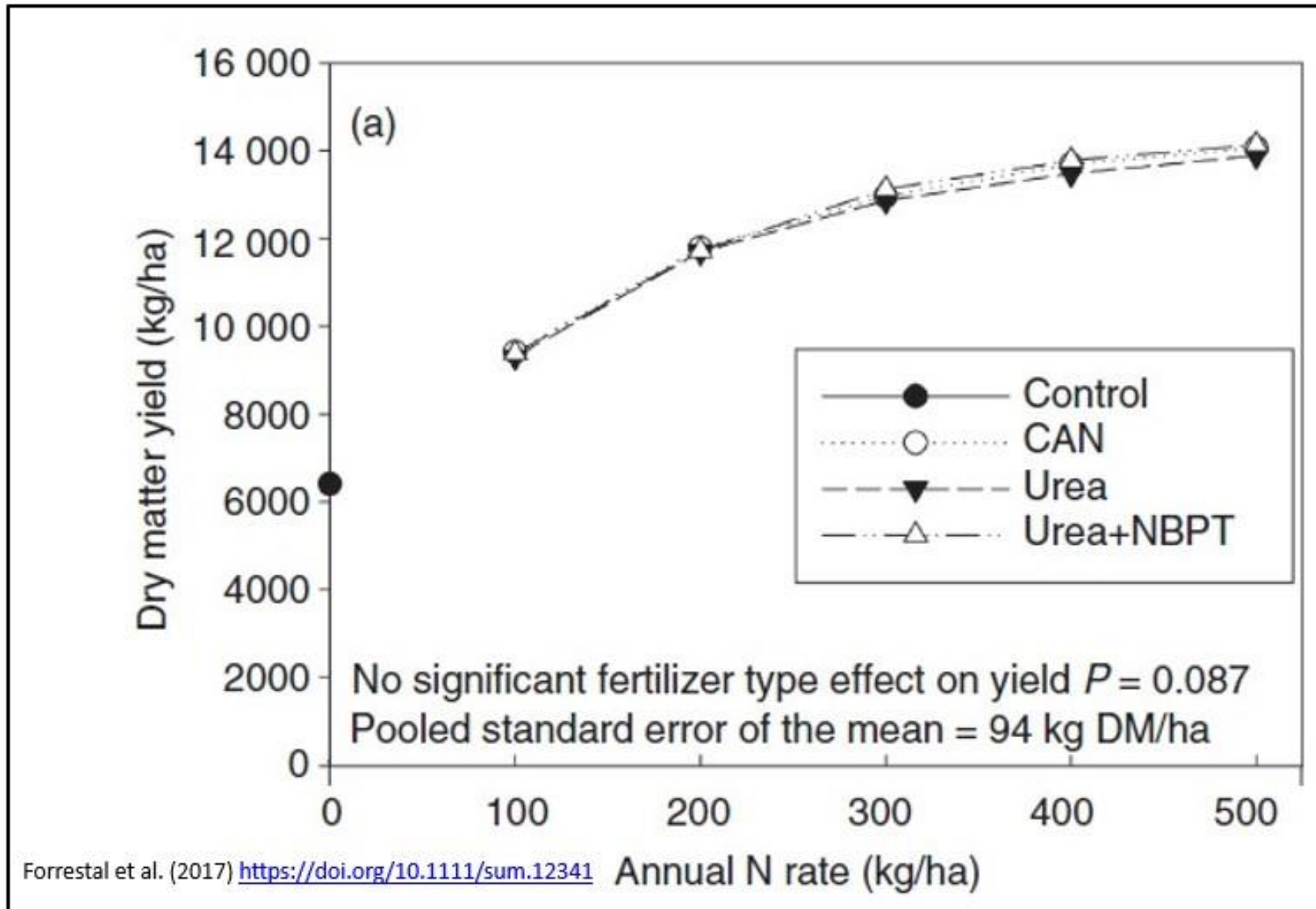
- Farm size 50ha
- 67 cows
- Milk solids/cow – 587kg
- 34 - 0 to 1 yr olds
- 23 - 1 to 2 yr olds
- Stocking rate 1.91 LU/ha
- N rate 208 kg N/ha 74% N straight



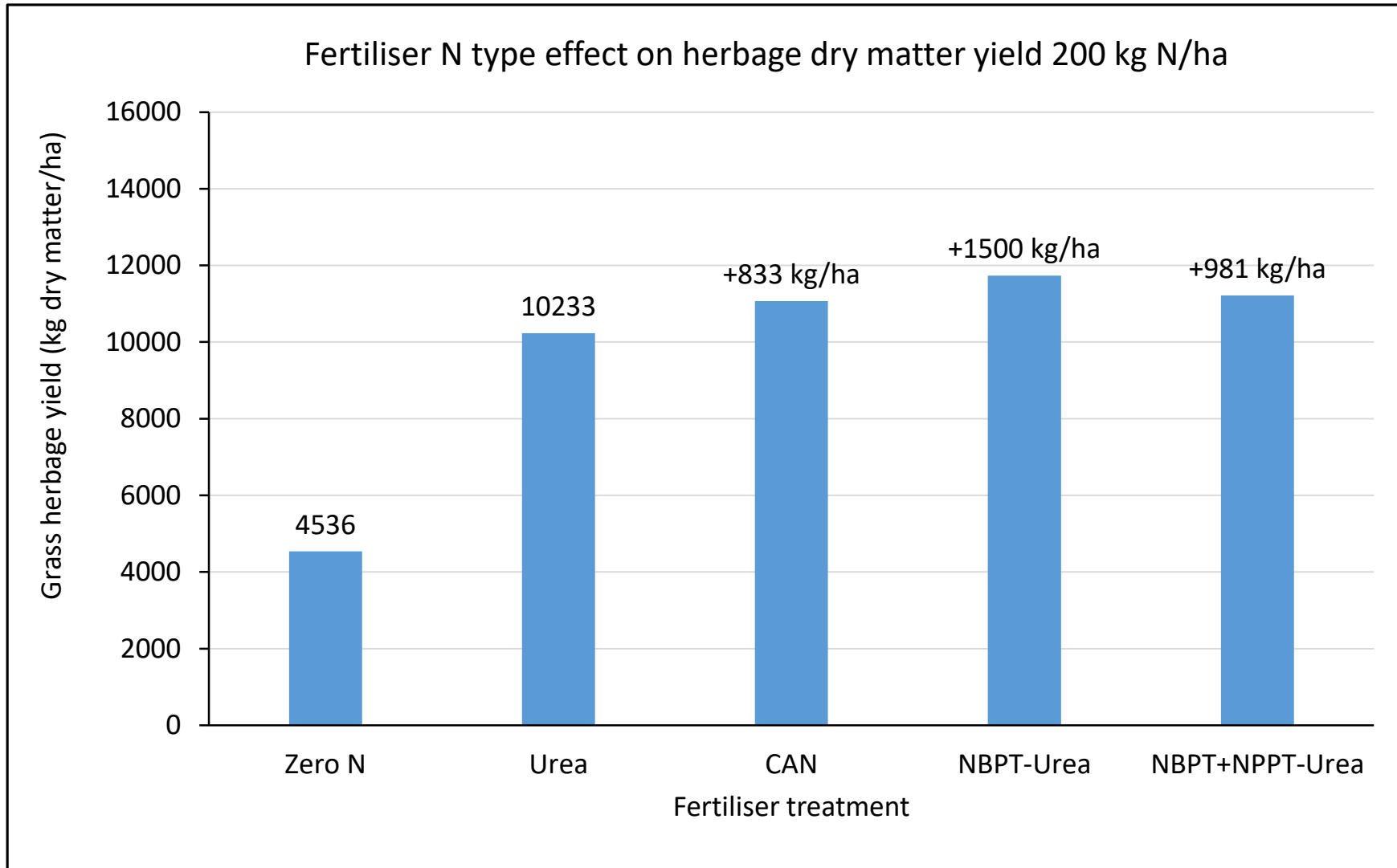
- 33.5 tonnes reduction in CO₂ equivalent emission



2013 & 2014 trials at 3 sites Urea vs CAN vs NBPT-Urea Johnstown Castle, Moorepark, Hillsborough



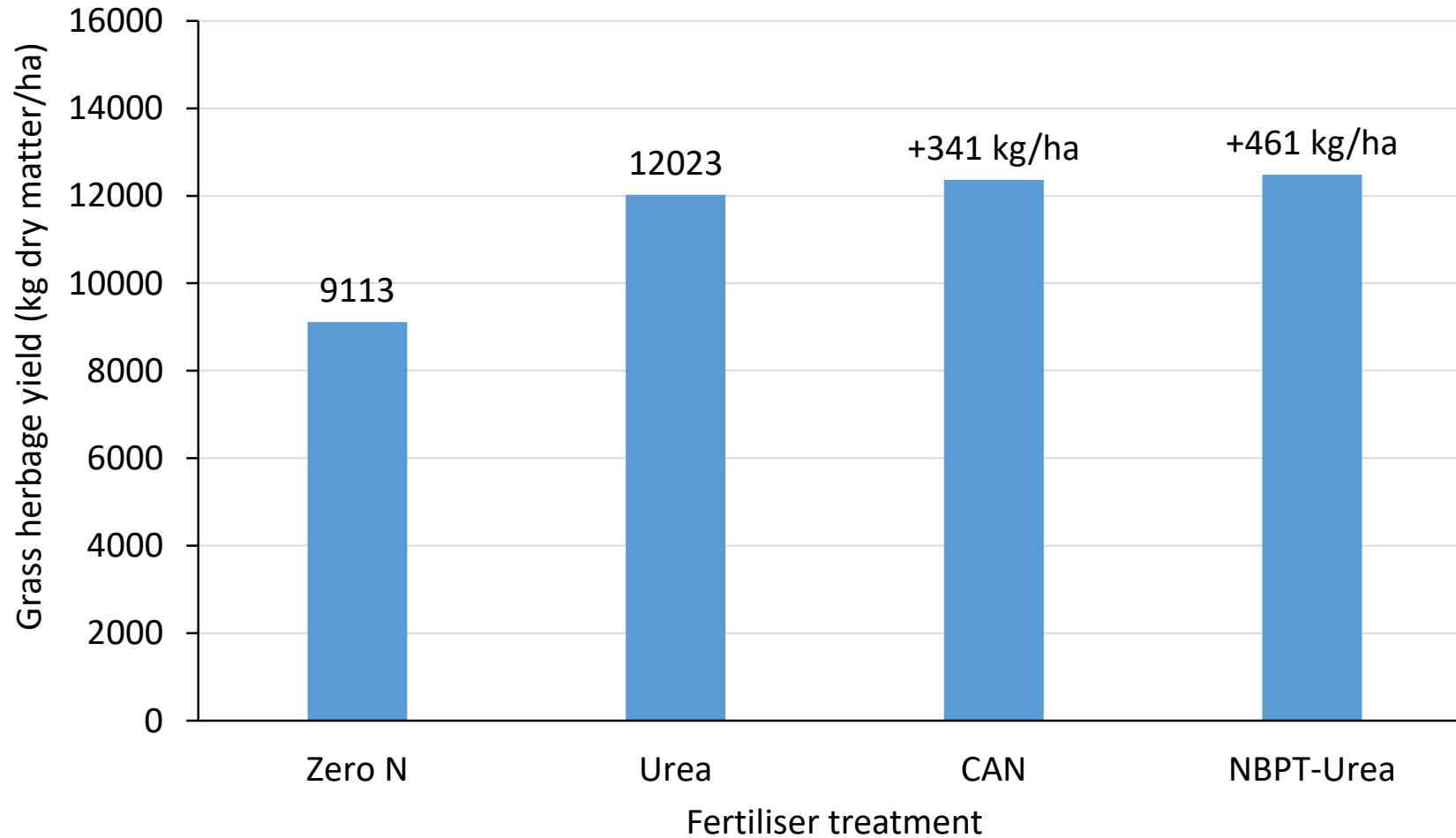
2017 trial Urea vs CAN vs NBPT-Urea vs NBPT+NPPT-Urea Johnstown Castle



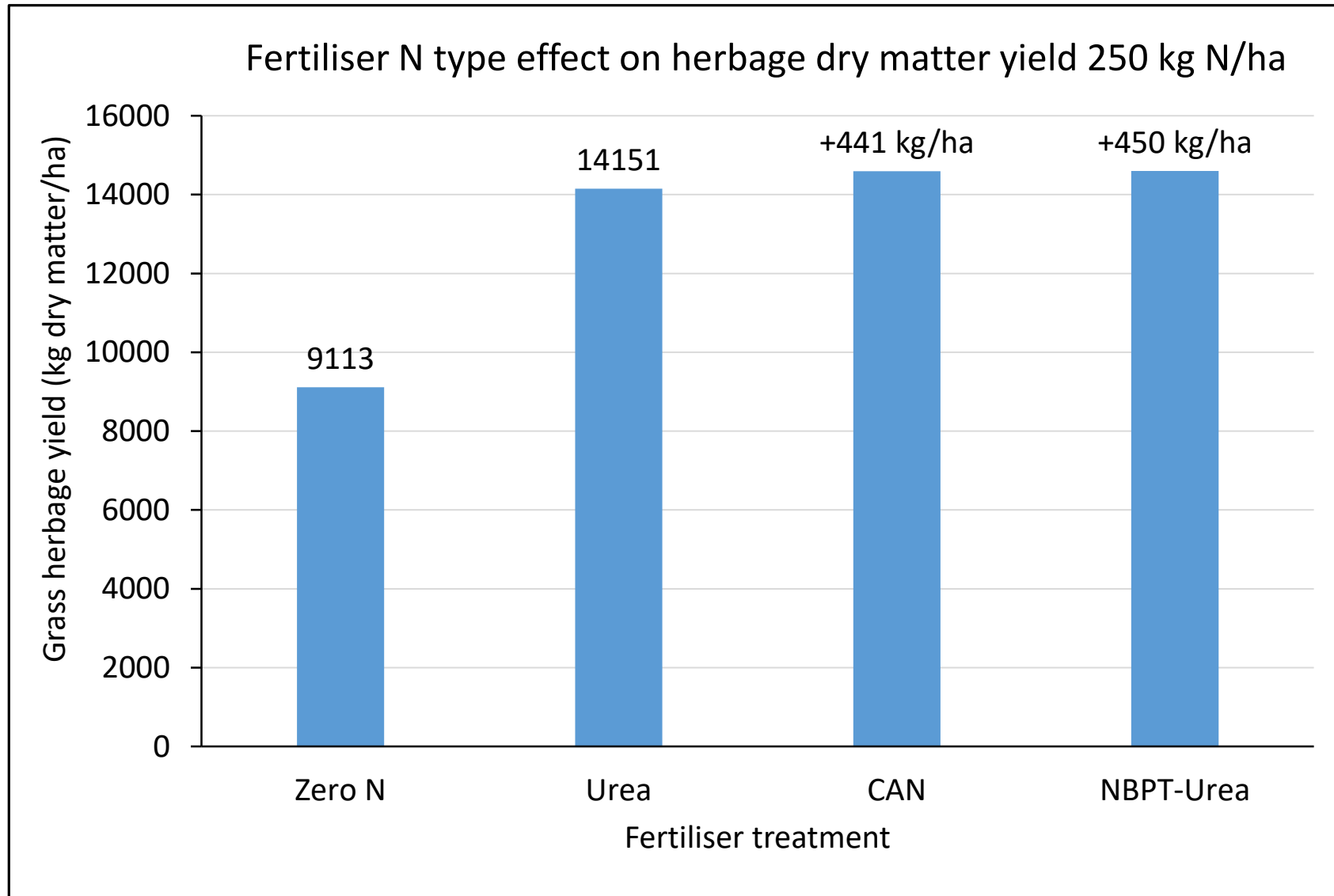
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2019, 2020, 2021 Grazing trials Urea vs CAN vs NBPT-Urea Moorepark, Clonakilty, Athenry, Ballyhaise – 150 kg N/ha

Fertiliser N type effect on herbage dry matter yield 150 kg N/ha



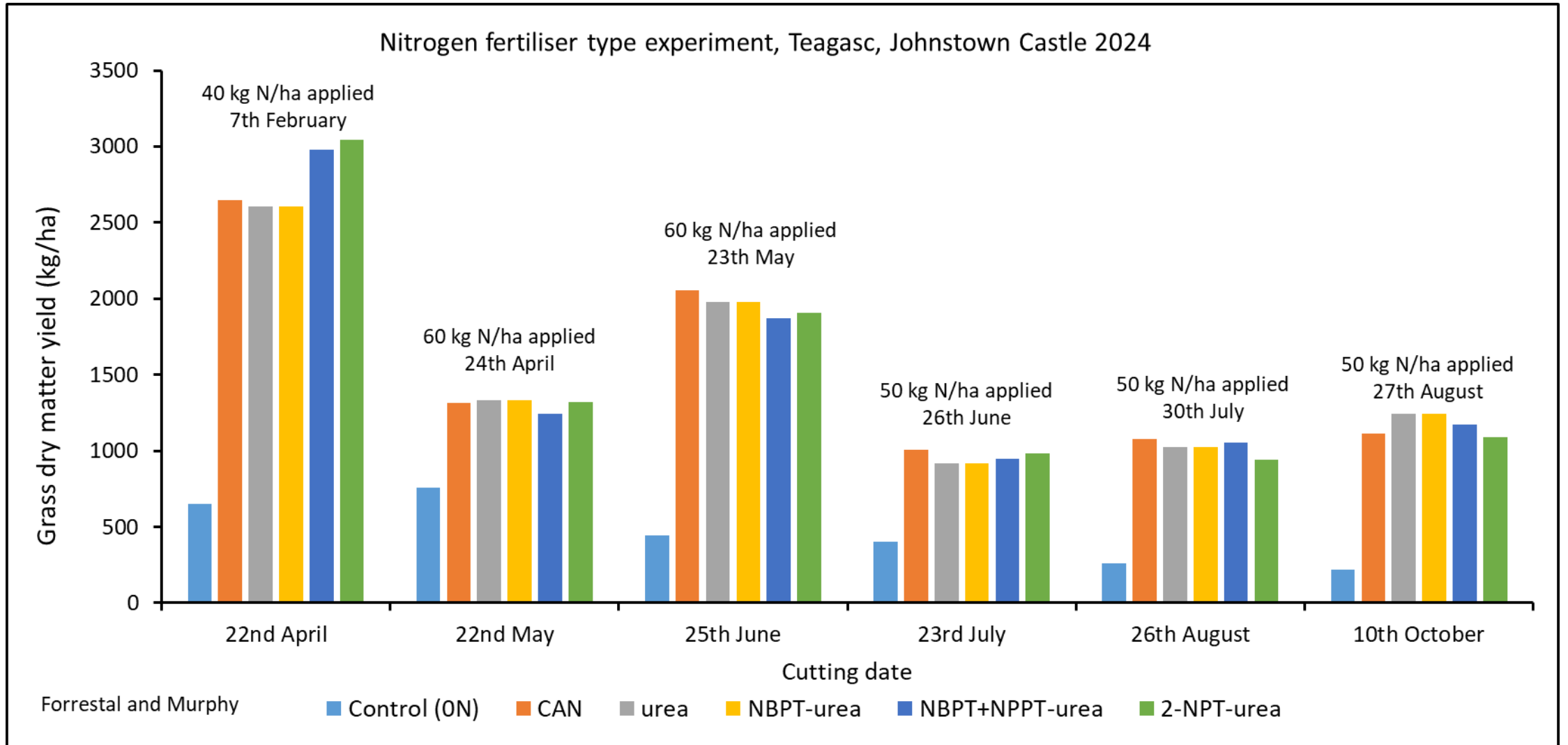
2019, 2020, 2021 Grazing trials Urea vs CAN vs NBPT-Urea Moorepark, Clonakilty, Athenry, Ballyhaise – 250 kg N/ha



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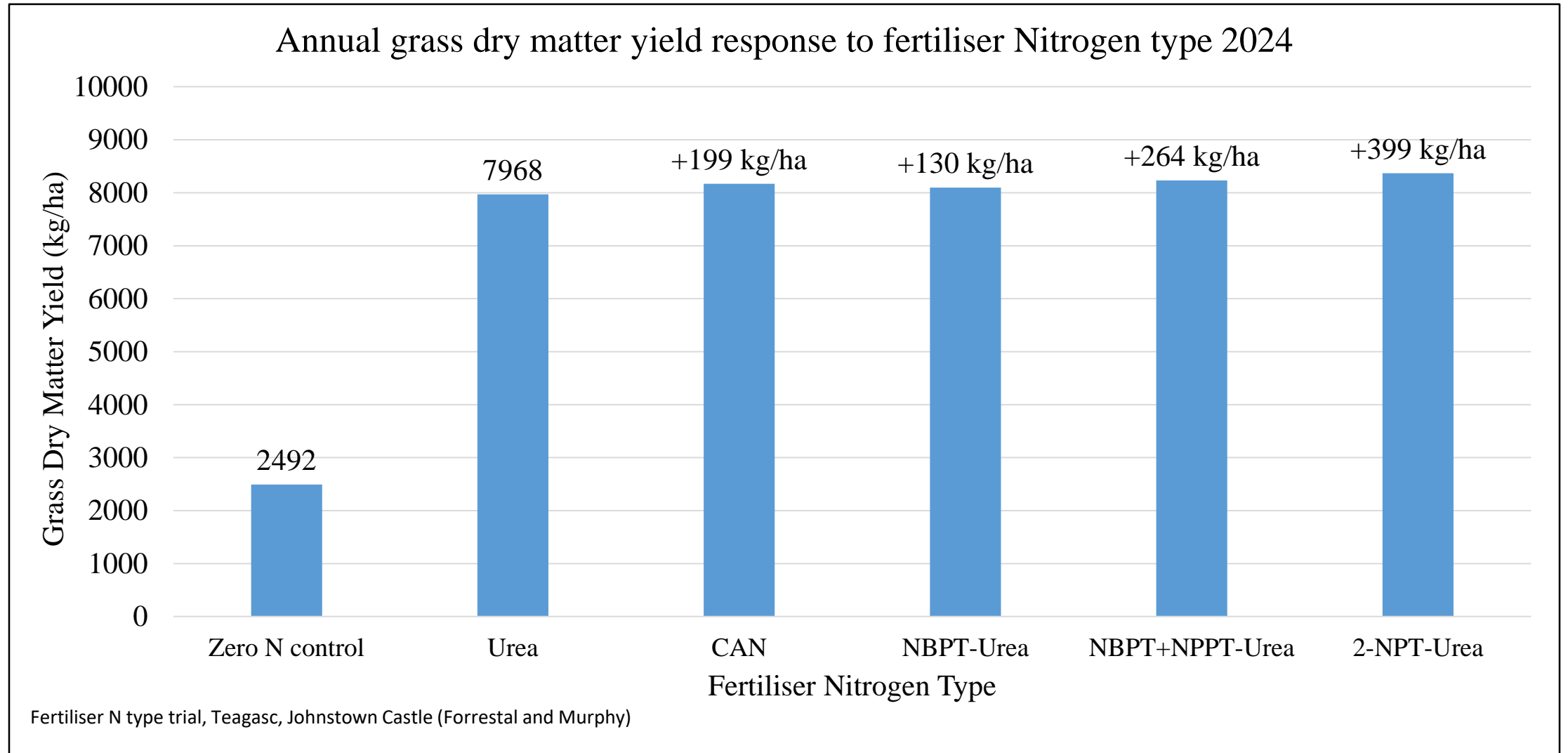
2024: Johnstown Castle N fertiliser type head to head

Urea vs CAN, NBPT-Urea, NBPT+NPPT-Urea, 2-NPT-Urea



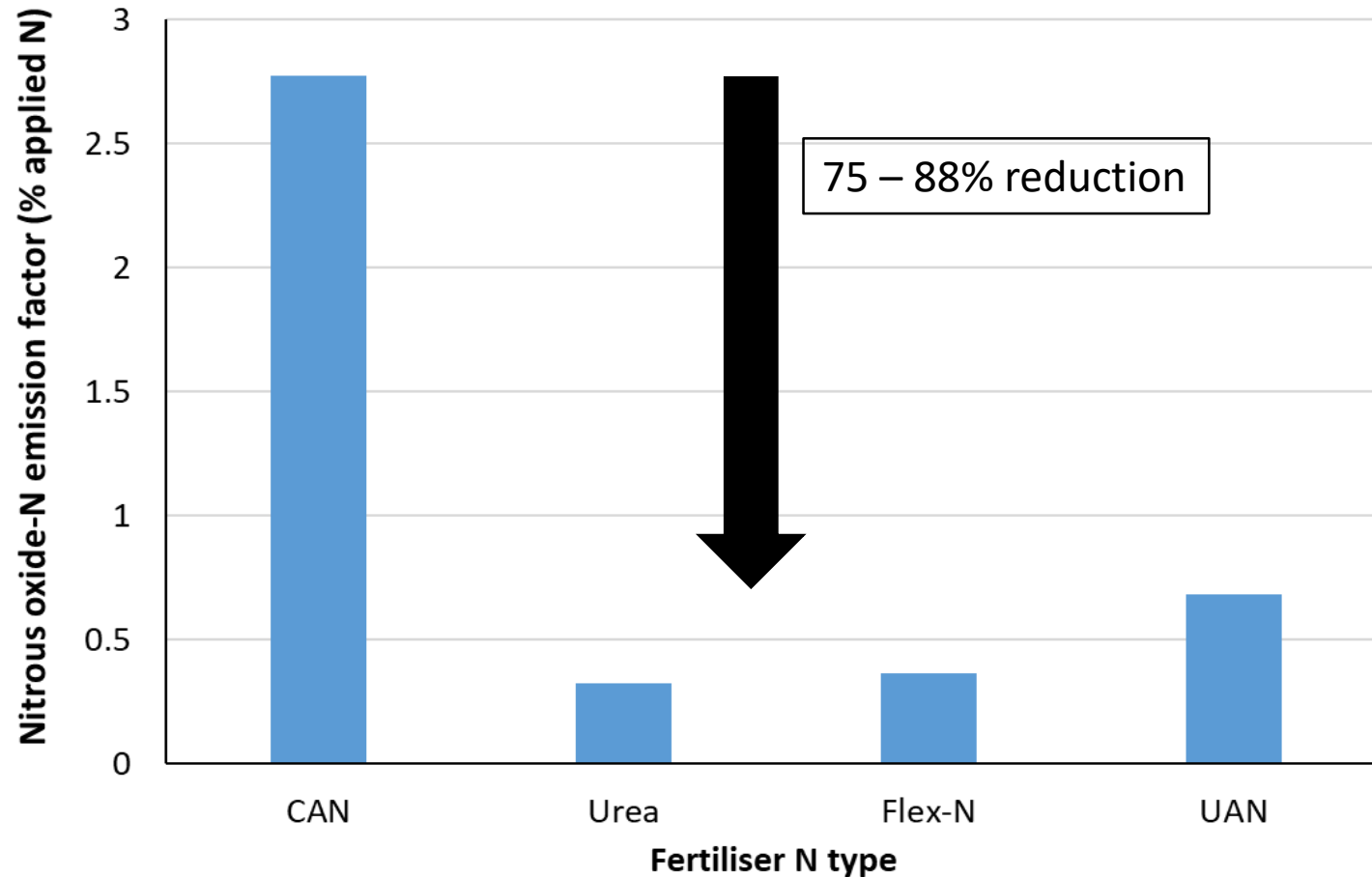
2024: Johnstown Castle N fertiliser type head to head

Urea vs CAN, NBPT-Urea, NBPT+NPPT-Urea, 2-NPT-Urea - 2



What's new? DAFM funded 2021R477

Average of Autumn and Spring Applications

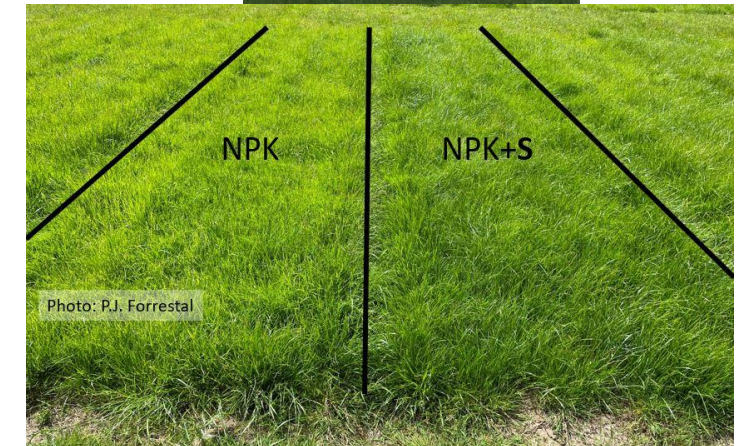


Adapted from Matse et al. (in review) DAFM funding 2021R477

- Potential of low nitrate liquid N to also reduce N_2O emissions
- Further N_2O emission reductions using Nitrification inhibitors – close to background levels
- Yield benefits
- Flex-N similarly low ammonia emissions to NBPT+NPPT-Urea

Summary / Tips

- Reduce sector emissions use/ stick with NBPT, NBPT+NPPT or 2-NPT protected Urea
- In 2025 focus on spreader calibration and fertiliser physical quality
- Liquid N also shows potential to reduce emissions
- Nitrification inhibitors show potential to further reduce emissions
- Include a few rounds of a Sulphur containing fertiliser – yield and nitrate leaching reduction benefits
- Potential of Plantain inclusion in swards to reduce nitrate-N leaching



Acknowledgements:

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