The More Profit from Nitrogen Program (MPfN) is a four year partnership between Australia’s four most intensive users of nitrogenous fertilisers: cotton, dairy, sugar and horticulture. The Program is conducting research and development to increase nitrogen use efficiency (NUE) across the four sectors whilst improving profitable and sustainable use. By better understanding the influence of contributing factors on NUE in farming systems, the Program is:

- Generating greater knowledge and understanding of the interplay of factors to optimise N formulation, rate and timing across industries, farming regions and irrigated/ non-irrigated situations;
- Generating greater knowledge and understanding of the contribution (quantifying rate and timing) of mineralisation to crop or pasture N budgets; and
- Generating greater knowledge and understanding of how enhanced efficiency fertiliser (EEF) formulations can better match a crop or pasture specific N requirements.

The Program is supported by $5.889 million funding from the Australian Government’s Rural Research and Development (R&D) for Profit program in addition to cash and in-kind contributions from each of the industry sectors, research organisations and collaborating partners equating to $9.757 million.

Ten research sub-projects are being delivered by 8 lead research agencies, together with a further 24 collaboration partners, encompassing 72 interacting research, technical and PhD candidate positions. The research is informing new N fertiliser formulations, application and measurement technologies, decision support tools and best management practice guidelines. A total of 40 field based trials have been established, from Darwin in the north to Hobart in the south, and are supported by laboratory experimentation and modelling.

The MPfN Program is at the mid-way point of activities but is already resulting in a more collaborative research effort to accelerate aligned research methodology, standardising terminology to reduce confusion for industry end users and communicating NUE outcomes using common indicators across the four industry sectors. It has become the platform for cross-industry collaboration on N management, and the results are fostering unprecedented information and knowledge exchange amongst Australia’s leading scientists. Since commencing in 2016, the MPfN Program has produced early outputs which are already embedded into industry extension programs, reducing lag time between the research and adoption by cotton, sugar, horticulture and dairy producers. By mid-2022, it will deliver technologies and decision support resources that will significantly increase NUE to reduce environmental impact whilst increasing the long-term sustainability and profitability of Australian farming businesses.
**Increasing nitrogen use efficiency in dairy pastures.**

**Lead Partner:** Queensland University of Technology

**Partners:** NSW DPI and Dairy Australia

**Project Leader:** Dr. David Rowlings

**Project Background:** [Dairying for Tomorrow Website](#)

Trials established to investigate interactions between N application (including EEFs), soil mineralised N and irrigation in sub-tropical pasture systems.

**Improving dairy farm nitrogen efficiency using advanced technologies.**

**Lead Partner:** University of Melbourne

**Partner:** Dairy Australia

**Project Leader:** Dr. Helen Suter

**Project Background:** [Dairying for Tomorrow Website](#)

Gaining a better understanding of the amount of N supplied through mineralisation to dairy pastures in South West Victoria. An industry nutrient calculator, which accounts for mineralised available N, will be developed for the industry Fert$mart N BMPs.

**Quantifying the whole farm systems impact of nitrogen best practice on dairy farms.**

**Lead Partner:** University of Melbourne

**Partners:** Tasmanian Institute of Agriculture (TIA) and Dairy Australia

**Project Leader:** Prof. Richard Eckard

**Project Background:** [Dairying for Tomorrow Website](#)

Employing Australian dairy’s DairyMod to test and validate current industry Fert$mart N BMPs across key dairy farming regions.
**Project Backgrounds:** [SRA Website](#)

**Smart blending of enhanced efficiency fertilisers to maximize sugarcane profitability.**

**Lead Partner:** Queensland Department of Environment and Science  
**Partners:** Sugar Research Australia, HCPSL, Farmacist, TRAP Services, QDAF, QDEHP  
**Project Leader:** Dr. Weijin Wang  

Investigation into optimal blending ratios of EEFs with conventional urea to better match sugarcane crop N dynamics across five sugarcane regions.

**Improved nitrogen use efficiency through accounting for deep soil and mineralisable N supply & deployment of EEFs to better match crop N demand.**

**Lead Partner:** NSW Department of Primary Industries (NSW DPI)  
**Partners:** Sugar Research Australia, Sunshine Sugar, Southern Cross University  
**Project Leader:** Dr. Lukas Van Zwieten  

Assessment of N stores in soils of sub-tropical sugarcane regions to improve understanding of N supplied from mineralisation and optimal use of EEFs to better match crop N demand. A dose response model for urea and PCU is being developed.

**New technologies & managements: transforming NUE in cane production.**

**Lead Partner:** Queensland Department of Agriculture and Fisheries  
**Partners:** Sugar Research Australia, University of Queensland, Agresearch  
**Project Leader:** Dr. Matthew Redding  

Targeted formulation and management technique options investigated to better match N release to cane crop demand by controlling N transformation and solubility and combating N “leakiness” to the environment.
Optimising nutrient management for improved productivity & fruit quality in mangoes.

**Lead Partner:** NT Department of Primary Industry and Resources

**Partners:** Hort Innovation, QUT, Australian Mango Industry Association.

**Project Leader:** Dr. Constancio (Tony) Asis

**Project Background:** Hort Innovation Website

Research is using $^{15}$N to quantify plant N and cycling through the soil-plant-atmosphere system of mango crops and determine soil mineralised N to inform industry NUE BMPs, including EEF options.

Optimising nutrient management for improved productivity & fruit quality in cherries.

**Lead Partner:** Tasmanian Institute of Agriculture/ University of Tasmania

**Partners:** Hort Innovation, Cherry Growers of Australia

**Project Leader:** Dr. Nigel Swarts

**Project Background:** Hort Innovation Website

Research is using $^{15}$N to quantify plant N and cycling through the soil-plant-atmosphere system of cherry crops and determine soil mineralised N to inform industry NUE BMPs, including biological options.
More profit from nitrogen - enhancing nutrient use efficiency in cotton.

Lead Partner: NSW Department of Primary Industries (NSW DPI)

Partners: Cotton Research & Development Corporation, CSIRO, UoM & University of Queensland

Project Leader: Dr. Graeme Schwenke

Project Background: CottonInfo Website

Investigating the intricate relationship between N supplied through soil mineralised and fertiliser sources, P supply, fertiliser placement & timing, and irrigation strategy to achieve greater NUE and improved P soil nutrition.

Optimising nitrogen and water interactions in cotton.

Lead Partner: University of Southern Queensland (National Centre for Engineering in Agriculture)

Partners: Cotton Research & Development Corporation, QUT

Project Leader: Dr. Dio Antille

Project Background: CottonInfo Website

Increasing understanding of the influence of rainfall/irrigation wet-dry cycles on mineralising soil organic N into plant available forms and trial of a potentially available organic N rapid soil test.

This project was completed in August 2018 and the final outcomes of this two year project will be presented.
Click on the map to visit the MPfN interactive Google Map.