



**NEW NUTRITION INVESTMENT WESTERN
REGION DR JULIA EASTON**
(PRESENTED BY BRONDWEN MACLEAN)



MORE PROFIT FROM CROP NUTRITION II

GRDC National initiative (2012 – 2017)



Investment Program outcomes

- Make nutrient use efficiency traits available to plant breeders in adapted backgrounds.
- Better match N, P, K and S inputs to meet crop demand and minimise losses and tie-up.
- Make better use of micro-nutrients to correct deficiencies and enhance crop yield .
- Develop and test new fertiliser products and adjuvants.
- Provide information to growers to make effective fertiliser decisions.
- Coordination of a program with a lasting legacy of analysed, reported and published information.

NEW INVESTMENT IN NUTRITION



CURRENT TENDERS – CLOSE 25 JULY 2017

1. Improved sampling methods to better predict nutrient availability and supply for soils in the Western Region
2. Increasing profit from N, P and K fertiliser inputs into the evolving cropping sequences in the Western Region
3. Nutrient re-distribution and availability in ameliorated and cultivated soils in the Western Region

More details at <https://grdc.com.au/research/applying-and-reporting/current-procurement>

GRDC Manager – Dr Julia Easton (Manager Agronomy, Soils & Farming Systems – West)

INCREASING PROFIT FROM N, P AND K FERTILISER INPUTS

NITROGEN



- By 30 June 2022, complete a program of research and generate new knowledge and understanding of N within the farming system with a focus on:
 - Direct measurement of the quantities and fate (including plant uptake) of N immobilised and mineralised from the soil organic pool, different types of stubble (species, amount, management, fallow), residual N fertiliser, legume-derived pools (including different species).
 - Assessment of changing N mineralisation rates due to increasing summer/autumn rain in the Western Region and the impact on crop N requirements.
 - The economics of N decision making in Western Region farming systems.

INCREASING PROFIT FROM N, P AND K FERTILISER INPUTS

PHOSPHORUS



- By June 30 2022, complete a series of experiments and generate new knowledge to determine the impact, including economics, of repeatedly applying low rates of P at crop establish. The research should focus on wheat, canola and lupins.
- By June 30 2022, complete a series of experiments and generate new knowledge to understand P availability and measurement thereof within the soil profile.
 - The extent, impact and ways to correct P deficiency in sub-soils.

INCREASING PROFIT FROM N, P AND K FERTILISER INPUTS

POTASSIUM



- By 30 June 2018 complete a technical and economic review and present GRDC with a report on the suitability of soil test methods to predict K responsiveness for the key soils in key environments across the Western Region.
- By 30 June 2022, complete a series of experiments and generate new knowledge and understanding of K in the dominant soil types in Western Region. The research will focus on:
 - Understand K transformations and the fate of soil and fertiliser K.
 - Physiology of plant uptake of K and K use efficiency in wheat, canola and barley.
 - K movement into and through soils including the extent and depth of K leaching.

INCREASING PROFIT FROM N, P AND K FERTILISER INPUTS

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INCREASING PROFIT FROM N, P AND K FERTILISER INPUTS

CAPACITY BUILDING



- By June 30 2022, at least one (1) post-doc researcher and two (2) PhD students have completed projects. Research topics can be N, P, K or trace elements.
- By June 30 2022, at least seven peer reviewed journal articles published communicating the results of the research in outputs 1 to 7.

INCREASING PROFIT FROM N, P AND K FERTILISER INPUTS

EXTENSION



- Annually, for the life of the project, upload all field trial results to the Better Fertilisers Decisions Cropping database.
- Annually, for the life of the project, deliver extension and training to increase the skill of at least 600 growers, advisers and industry professionals. As a minimum this will include;
 - Presentations at field days and Updates workshops in Perth and regional areas.
 - At least three workshops per annum delivering technical knowledge to advisers.
 - At least five workshops per annum extending research outputs to growers.

INCREASING PROFIT FROM N, P AND K FERTILISER INPUTS

REPORTING



- By March 2018, and each subsequent year, an Annual Progress Report detailing the key findings of the project for the reporting period.
- By June 2022, a Final Technical Report amalgamating the key findings, new knowledge and conclusions of the project to provide an overall interpretation of the work.

Nutrient re-distribution and availability in ameliorated and cultivated soils in the western region



Investment Output 1

- By June 30 2021, conduct a series of experiments on the major soils types in the Western Region to understand the effect of mechanical soil amelioration on nutrient re-distribution and its impact on crop nutrient supply. The research will focus on;
 - The effect of different mechanical soil amelioration practices on the re-distribution of plant-available nutrition through the soil profile.
 - Changes in soil supply & crop response to fertiliser in mechanically ameliorated soils.
 - New soil testing methodology to accurately determine plant-available nutrition in ameliorated soils.
 - Collaboration with the other nutrition projects is required.
 - Use revised soil tests and crop response information to provide

Nutrient re-distribution and availability in ameliorated and cultivated soils in the western region



Investment Outputs cont...

- At least two peer reviewed journal articles published by June 2021.
- Annually, for the life of the project, extend the research to at least 300 growers, advisers and industry professionals.
- By March 2018, and each subsequent year, an Annual Progress Report detailing the key findings of the project for the reporting period.
- By June 30 2021, a Final Technical Report amalgamating the key findings, new knowledge and conclusions of the project to provide an overall interpretation of the work.

Improved sampling methods to better predict nutrient availability and supply for soils in the Western Region

Investment Outputs



1. By 30 June 2020, complete a series of field and glasshouse experiments evaluating the accuracy of different soil sampling methodologies to measure plant available nutrients. (Spatial & depth accuracy plus timing & number of samples per paddock)
2. By 30 June 2020, a report to GRDC and extended to industry outlining a new soil sampling methodology that improves the detection of plant available nutrients and improves grower decision making.
3. By March 2018, and each subsequent year, an Annual Progress Report detailing the key findings of the project for the reporting period.
4. By June 2020, a Final Technical Report amalgamating the key findings, new knowledge and conclusions of the project to provide an overall interpretation of the work.

