

# Plain English Summary

<b>Project Title:</b>	Improving the Understanding of Nitrogen Use Efficiency and Soil Water Interactions
<b>GRDC Project No.:</b>	2014.04.19
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<b>Objectives</b>	<ul style="list-style-type: none"> <li>To build an understanding of the current nitrogen use efficiency of four soil types. To understand how efficiently applied nitrogen is used in the soil. To educate growers and advisors on how to improve nitrogen use efficiency through a greater understanding of the soil water interactions and use this information to reduce production risk.</li> </ul>
<b>Background</b>	<p>There is increased volatility in production levels and grain producers throughout Western Australia are facing an environment with increasing climatic and input cost variability. Increased variability creates an elevated level of risk for all cropping businesses in the state. This study focused on the objective of reducing grower risk. By testing soil nitrogen levels to depth close to sowing, accurate soil profile nitrogen is known at seeding. From this information plant available nitrogen can be modelled at sowing to develop a Nitrogen response curve, allowing informed growers to tailor nitrogen applications to a range of estimated yields, increase their level of risk management and reduce their risk of either under or over fertilizing a particular soil type.</p> <p>The research developed a concept that growers can implement and access during the growing season. It is able to provide real time information and improve confidence in crop performance and yield potential. This will allow growers to allocate nutritional inputs and market their grain based on informed knowledge.</p>
<b>Research</b>	In this research the model "iPaddock Yield" provided the greatest level of accuracy in predicting final grain yield on July 31 <sup>st</sup> 2015. The simple French & Schultz "Broken Stick" model was very close to the accuracy of the iPaddock Yield 77% and 74% accuracy. When there is confidence in the early to mid-season yield prediction combined with accurate soil Nitrogen testing and modelling, there is a greater chance of maximizing profits from applied nitrogen.
<b>Outcomes</b>	This research showed that the point at which maximum N recovery is achieved is not generally the most economic rate to apply N. The point does show that the crop is still very responsive to additional N and this forms the N response curve. The most economic point on this curve, will be where the curve flattens out. At this point, additional profit from one extra unit of applied N is equal to two times the value of that unit of applied N.
<b>Implications</b>	
<b>Publications</b>	MIG 2015 Summary, Highlights of Farming Systems Research