

*Extended Abstract*

# Machinery and Labour Requirements as Influenced by Diversified Farming Systems in The Australian Northern Grain Production Region <sup>†</sup>

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Farming systems in tropical regions of the world have been shown to be underperforming. For instance, recent analysis that only about 29% of current crop sequences in the northern grains region of Australia are achieving 80% of their water-limited yield potential [1]. Consequently, several farming systems analyses have been conducted to enhance soil structure, water and nutrient use efficiency and the resilience of cropping systems to increasing soil-borne pathogens. While biophysical optimisation of the farming system may be possible to improve the efficiency of most farming systems, one key element that is often ignored is how the intensity and diversity of different cropping systems impact on the labour and machinery requirements. Considering these factors is crucial as they can influence the adoption of particular innovations at the farm level. Here, we combined the Agricultural Production Simulator (APSIM) outputs with farm surveys to examine the machinery and labour requirements of eight crop rotations in the northern cropping zone of Australia. Results showed that the low-intensity systems required 46% less labour per ha than the higher-intensive systems, while the less diverse systems required about 33% less labour per ha than the more diverse systems. Planting and spraying operations respectively represent about 27% and 37% of total fieldwork requirements. We conclude that diverse rotations may create higher labour demand and peak periods that might, in some cases, limit the adoption of diversified crop rotations in some farm businesses, suggesting that labour efficiency can be an important consideration in farming systems research and analysis.

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## References

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