

Temporary immobilisation promotes high nitrogen use efficiency of irrigated rice

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Background to Riverina rice

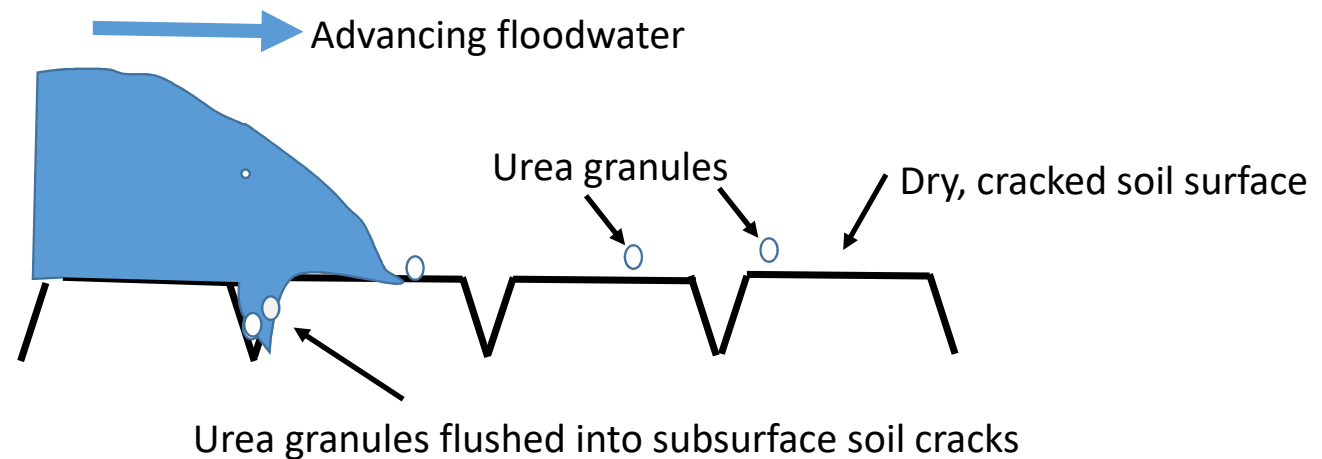
- Riverina: 200 -400 km north of Melbourne
- Fully irrigated, high solar radiation, few pests
- Average yield of medium grain rice 11 t/ha
- Average fertiliser use $\approx 180 \text{ kg N ha}^{-1}$, $\approx \frac{2}{3}$ before flooding
- NUE in farm survey $\approx 60\%$ above-ground N / N applied
- Why is NUE relatively high under these conditions?

Rice yield in response to 200 kg N/ha as urea applied at permanent flood (PF) or panicle initiation (PI)

	Yield (t/ha)	NUE (%)
0N	7.3	
200N – PF*	13.6	76
200N – PI*	11.4	39

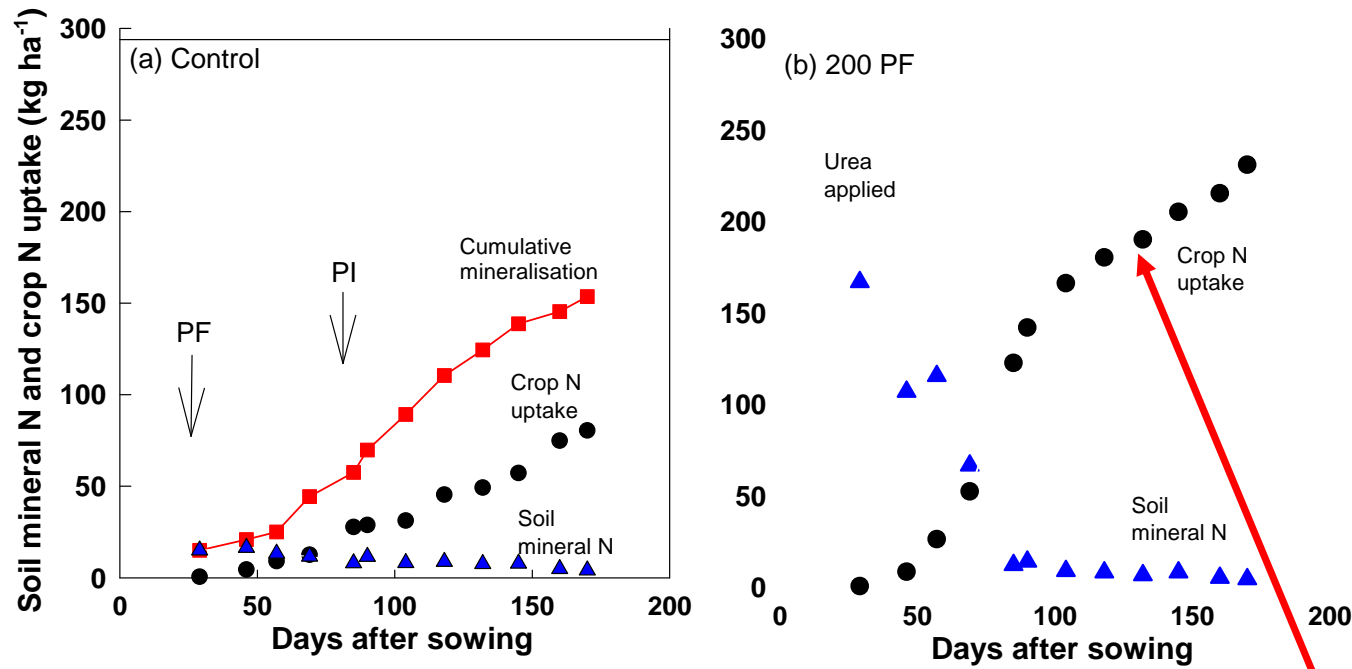
Why is pre-flood N application so efficient?

- Hypothesis 1: urea granules are flushed below the depth of denitrification.



Why is pre-flood N application so efficient?

Hypothesis 2: temporary immobilisation of fertiliser followed by remineralisation



Continued crop-N uptake despite low amount of soil mineral N. Was this N remineralised after immobilisation?