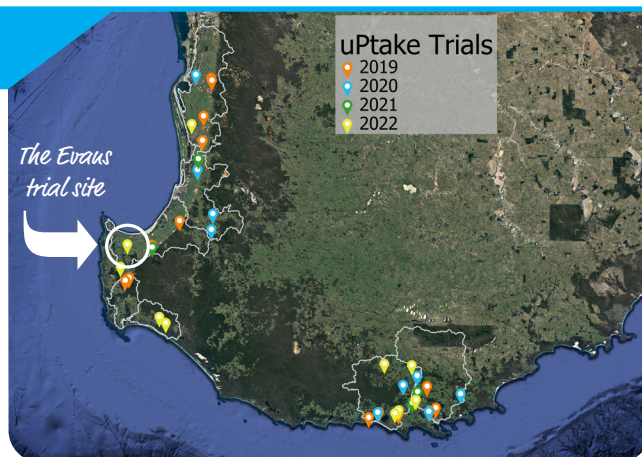


uPtake case study: Geographe catchment

The Evans trial



Grant Evans



Evans site July 2020

The award-winning uPtake project has increased farmer and industry confidence in the science behind phosphorus fertiliser recommendations by validating national critical soil test values for phosphorus (P) for south-west Western Australia (WA).

The Evans dairy farm is located at Jindong in the Geographe Catchment in the South West of WA. The family run business has grown steadily and is now milking 850 cows in a split-calving herd on 488 hectares.

“The uPtake project seemed to be a good opportunity to gain information on the impact of not applying phosphorus-based fertilisers if soil tests indicate they are not required.” – Grant Evans

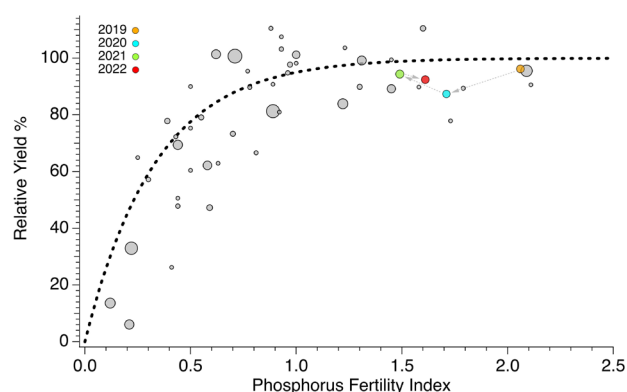
The Evans trial was undertaken over five years, in 2019, 2020, 2021, 2022 and 2023.



Evans trial site August 2021

Site characteristics

	2019	2020	2021	2022	2023
Phosphorus buffering index (PBI)	153.2	140.1	176.5	160.6	146
P fertility index	2.06	1.71	1.49	1.61	1.29



The graph left, plots the relative yield achieved when 0kg/ha of phosphorus plus basal nutrients were applied on each of the 50 uptake trial sites during four of the trial years (2019 -2022).

The coloured dots show the relative yield achieved at the Evans trial site during the 2019, 2020, 2021 and 2022 trial years, with the connecting line illustrating rundown over the same four year trial period.

The size of each dot in the chart relates to the phosphorus buffering index (PBI) of each site. The bigger the dot the higher the PBI of the trial site. Soils with a high PBI have a greater ability to adsorb and retain phosphorus. Soils with a very low PBI have a poor ability to adsorb phosphorus and are prone to leaching. The Evans site had a mid range soil PBI of 150. In Australia soil PBI's typically range from 1-1000.

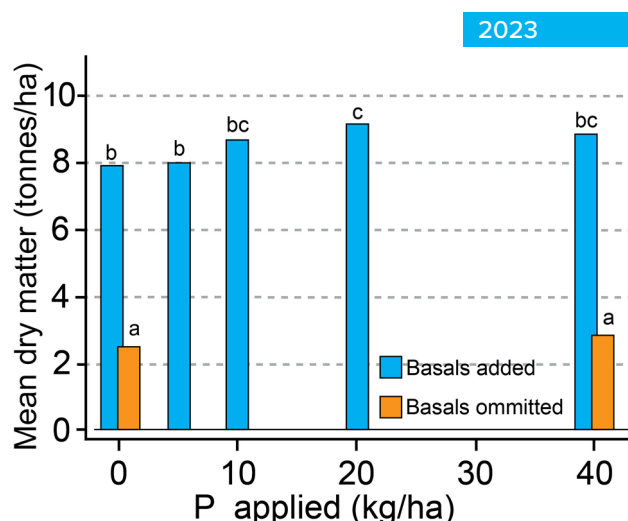
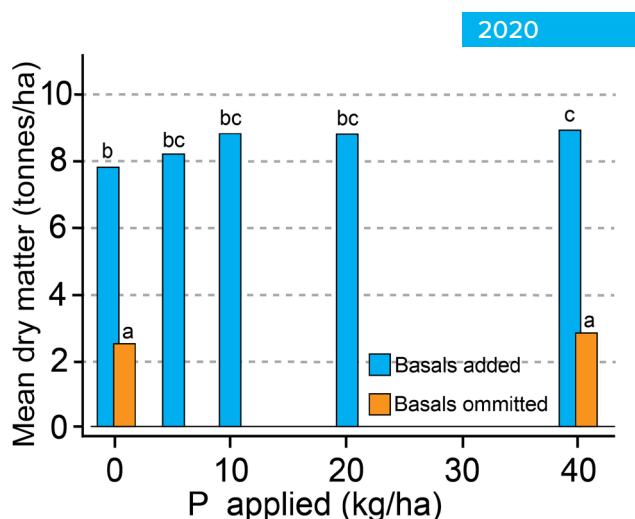
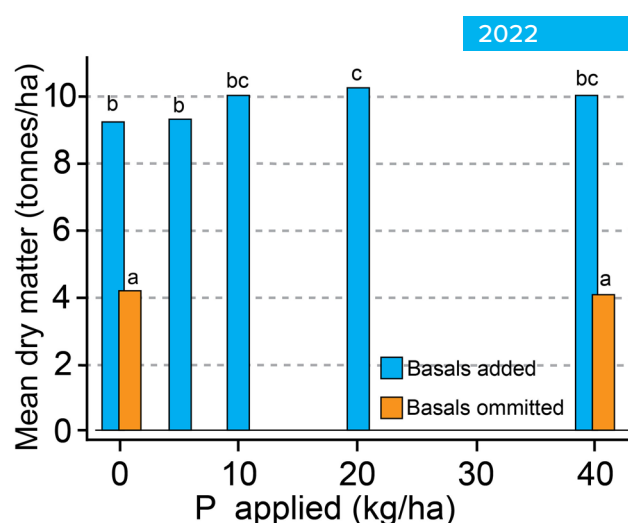
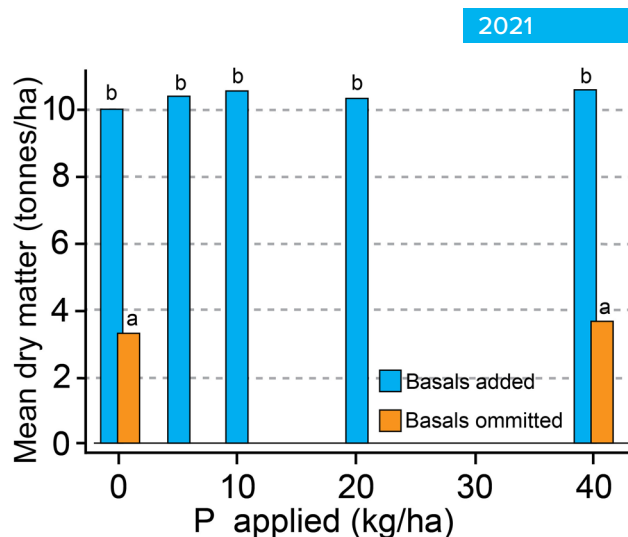
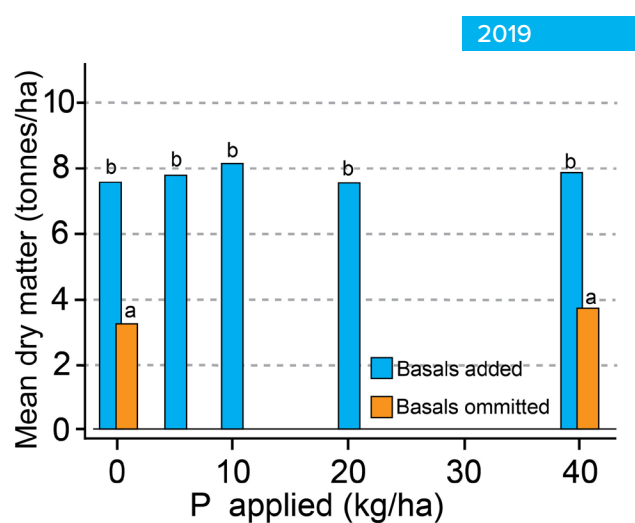
To see the influence a much lower soil PBI had on relative yield during consecutive trial years, see the 'McNab Trial' in the uPtake Case Study series.



For additional detail on the uPtake trials and explanations of technical terms, scan the QR code to view the uPtake Trail Summary 2019–23.

Key findings

Consistent with other uPtake trials, this site showed significant responses to basal nutrients (nitrogen, potassium, sulphur). The application of basal nutrients more than doubled pasture biomass, whether phosphorus was applied or not. Four years of measurements allowed the rundown of soil P fertility on control plots at this trial to be measured. Starting at a P fertility index of 2.06 in the first year, and reducing to 1.29 at the conclusion of the fifth trial year, there was little if any significant response to applied phosphorus.



Note: Treatments with the same letter are not significantly different



Key learnings

Application of phosphorus to soils with a P fertility index greater than 1, will not result in increased pasture biomass. The money saved from not applying phosphorus can be redirected to other nutrient constraints such as nitrogen, potassium and sulphur, dramatically increasing pasture biomass and farmer profits, while reducing the risk that phosphorus will be lost offsite.

“I was surprised at the length of time it took for the P fertility of the uPtake trial site located on our property to rundown. Even with an accelerated rate of nutrient removal with the pasture being mowed and removed every 5 weeks, the trial site still has an adequate P fertility level after 5 trial years.” – Grant Evans, farmer and trial host

“Running this type of trial over multiple years provides valuable information on the rate of change in soil phosphorus fertility. Under a normal dairy grazing scenario with removal rates of 5-7 kg P/ha/yr, it is estimated that with no P inputs it would take 25-35 years for the P fertility index to rundown to 1 because the P removal rate is much lower than what occurred in the trial. Knowing when to reapply P requires soil testing.” – David Weaver, Principal Research Scientist DPIRD

More information

These trials were among 52 trials established over four years across south-west WA. Together, the results from the trials validated that national critical soil test values for P are relevant to south-west WA soils and contemporary pasture species.

Learn more at estuaries.dwer.wa.gov.au/uptake



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