

uPtake – summary trial results 2020

What we did

Thirteen trials, 8 new and five continuing from 2019, were established in the uPtake project across the greater South West (Peel-Harvey to Oyster Harbour catchments) to examine the response of pastures to phosphorus (P). 19 trials were previously established in 2019. Trials were established on soils with low to high phosphorus buffering index (PBI) and with varying soil P levels. Pasture growth was measured in response to P applications ranging from 0 - 40 kg/ha, both with and without basal nutrients; nitrogen, potassium, sulphur and trace elements.

Why we did it

The information from these trials contributes to defining the **relationship between the amount of P in the soil and pasture growth**. The amount of P in the soil measured by a soil test to achieve a target production level is called the **critical value**. Critical values for soils with low to high PBI have been reported previously from similar trial data managed through the national **Better Fertiliser Decisions for Pastures project** (BFDPP link below). The uPtake project aims to assess how relevant the national data and critical values are for South West WA soil types and contemporary pasture species. A **fertility index** (soil test value divided by the critical value) is being used to compare trial results with expected results based on national data. A Fertility Index of 1 (soil P the same as critical value P) is considered optimal. For a Fertility Index 1 or greater – no pasture response to P is expected, and for soils with a Fertility Index of less than 1 – a pasture response to P is expected.

What we found

- **All 32 uPtake trial results to date are consistent with national BFDPP data** (i.e. trial results were within 20% of the predicted response) demonstrating the national data is relevant to SW WA conditions. Examples of a responsive and non-responsive trial are shown in Figures 1 and 2
- **All but one of the P responsive trials had a Fertility Index of less than 1**
- **Some sites with a Fertility Index of less than 1 did not respond to P even though they were predicted to.** This result is being investigated further, but suggests that the national data may be conservative for SW WA conditions
- **80% of the trials showed a response to other nutrients when P was not applied** (nitrogen, sulphur, potassium and micronutrients) indicating nutrients other than P were limiting production.



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So, what does this mean to me as a farmer?

1. Results from trials to date show that the national critical values for P used to inform P fertiliser recommendations are relevant to SW WA. You can therefore have confidence that P fertiliser recommendations based on critical values from BFDP are appropriate.
2. If your soil test shows that your soil contains excess P for your target production levels, (i.e Fertility Index greater than 1) adding more P will not increase productivity. Adding more P will unnecessarily increase costs and may escalate P movement into waterways, contributing to algal blooms. If your P soil test shows a Fertility Index of 1 at the start of the season, then it should contain sufficient P for seasonal pasture growth. Soil testing should guide subsequent pasture P requirements.
3. Addressing limiting nutrients in your soil (e.g. nitrogen, sulphur, potassium, micro nutrients) and correcting low pH can dramatically increase production and minimise unnecessary losses of nutrients to the environment.
4. Soil testing and comparison with critical values is essential to determine the nutrient requirements of your soil to meet your production targets.

Where to next

The uPtake project will run to June 2023 and aims to undertake at least 36 P response trials across the South West. Results from the next two years of trials will be added to the 2019/20 trial data to build a robust validation of national data and enhanced understanding of P responses in SW WA soils with contemporary pasture species.

8 P trials have been established in 2021, 5 new sites and 3 continuing. A split P application trial has also been established to look at the best time to apply P for optimising productivity and minimising loss to the environment. Watch out for field days and events on the results of these trials through your local catchment group.



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Figure 1 Typical (a) responsive and (b) non-responsive results from trials. (Dark grey bars basal nutrient applied, light grey bars no basal nutrients)

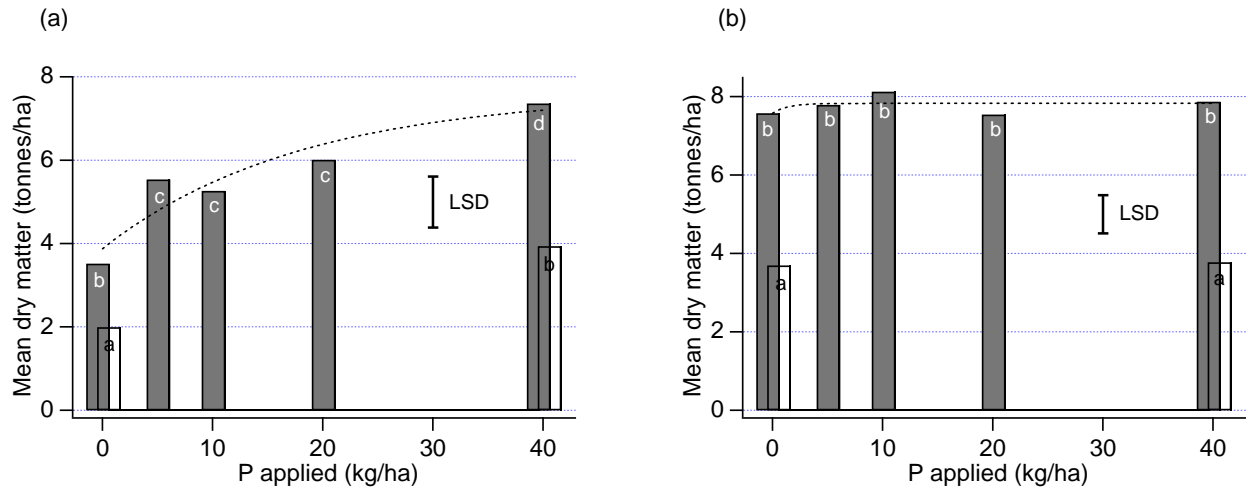
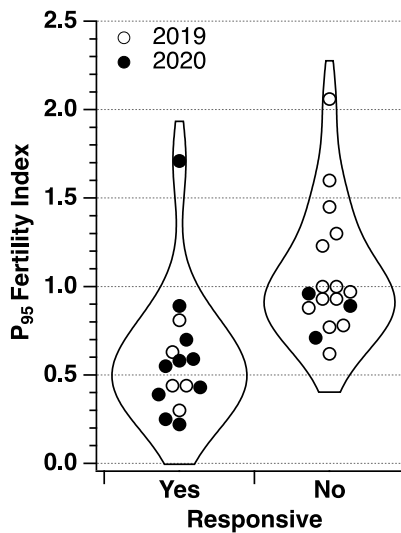


Figure 2 uPtake 201-2020 trial results based on trial site Fertility Index



Better Fertiliser Decisions for Pasture

<https://www.asris.csiro.au/downloads/BFD/Making%20Better%20Fertiliser%20Decisions%20for%20Grazed%20Pastures%20in%20Australia.pdf>

<https://www.publish.csiro.au/CP/CP19068>



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