

Total P Testing Pilot

Background & Rationale



- Standard approach measures **Olsen P (available P)**
- **Total P (full soil phosphorus reserve)** not tested for or well understood on farm

- Farmers continue to identify a knowledge gap between:
 - soil testing
 - nutrient advice
 - water quality outcomes

👉 Pilot designed to:

Build on Lancaster Uni's initial work and continue to build understanding on farm of how much phosphorus is actually held in soils and what this could mean for management

Rural Hub
Herefordshire



Herefordshire
Council



Lancaster
University



Environment
Agency



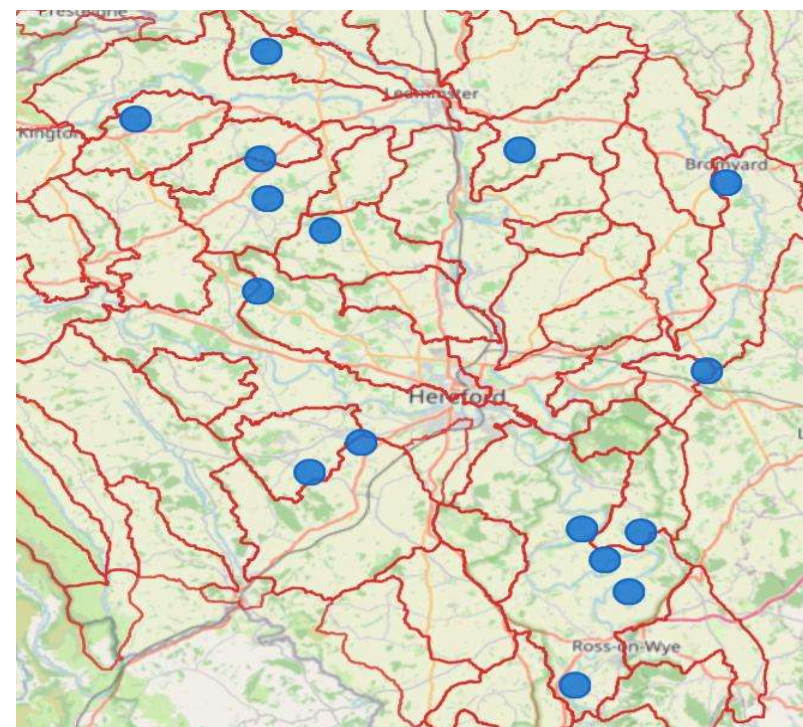
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Approach Taken

- Soil sampling across **16 farm holdings**
- Sampling undertaken by Cobb Agri
- Measured:
 - **Available P (ppm)**
 - **Total P (mg/kg)**

👉 Building another locally owned, real-world dataset from commercial farms

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Key Findings

1. Significant legacy phosphorus present

Avg Available P: ~36 ppm

Avg Total P: ~691 mg/kg

Max: >2200 mg/kg

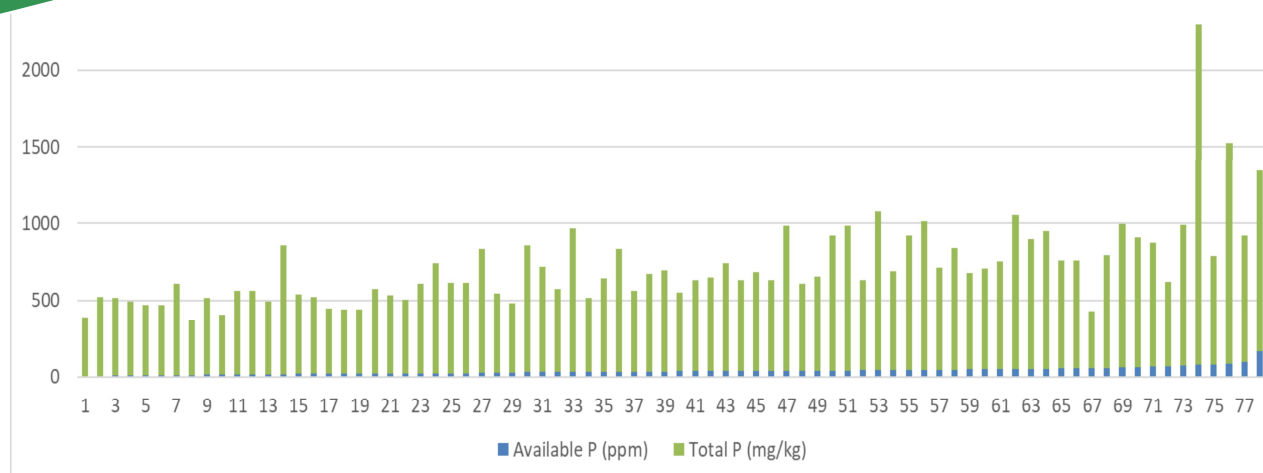
2. Available P ≠ Total P

Only a **moderate relationship** between these two parameters found in our dataset whereas Lancaster Phase 3 study indicated that Olsen P ≈ ~4% of **Total P** and they indicated a ~7 mg/kg Olsen P increase per 100 mg/kg Total P

👉 Key point:

Olsen P is not a reliable indicator of total phosphorus reserves

Soil Test Results 25/26



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More questions than answers...

1. How do soils release phosphorus?

How quickly does legacy P become available?

Does release differ by:

- soil type (sandy vs loam)
- biology / organic matter
- management history

2. Where does risk actually occur?

Which fields are:

- actively losing P
- vs simply storing it

Role of:

- drainage
- runoff pathways
- compaction / structure
- storm events

3. What works in practice?

Which actions reduce loss most effectively:

- input reduction?
- soil structure improvement?
- timing of applications?

Where can we:

- maintain yield
- while reducing inputs

Key gap:

We currently lack **field-scale evidence linking soil P → crop response → water outcomes**

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What next?

Participating farmers keen to test & trial reduced / no P inputs, alongside monitoring:

Production monitoring

- yield
- crop quality

Nutrient tracking

- crop offtake
- nutrient balance

They want to know...

- What are the links between:
soil phosphorus → crop performance → nutrient loss
- Can we identify:
highest risk fields
most effective interventions
- To build **practical, farmer-led evidence base** to enable change on the ground.

Opportunity through Defra Living Labs

👉 Build on the momentum and appetite in farming community to build practical, farmer-led evidence base to enable change on the ground.

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