



The James
Hutton
Institute

Dear land manager,

Phosphorus is an essential plant fertiliser. However, phosphorus is costly and, if it reaches watercourses, damaging to the environment. With this in mind, the James Hutton Institute is researching how to assist farmers and growers to best manage soil nutrient phosphorus.

Certain soil types allow applied phosphorus to rapidly leave the root zone of crops, where it is then lost to drains and watercourses. To examine which soil factors increase this risk, we would like to ask your help by collecting a sample of water from a field drain and a sample of soil from the same field. Field drains provide an ideal integrated picture of the soil phosphorus leaching away from the crop. In return we will report back to you on the current soil phosphorus status of this field and if the drain flow phosphorus concentration may indicate a risk of phosphorus losses from the soil. Knowledge of the relationship between phosphorus leaching and soil types will allow you to identify and act to reduce losses of valuable nutrients from fields, so that more is targeted to crop growth.

So it best indicates the amounts of phosphorus percolated through the soil profile, the drain flow sample should be from a field drain not receiving runoff from yards, steading or roads. Taking this sample requires filling the two enclosed bottles with drain water and noting drain flow conditions and likely field area it captures (as IACS field id or OS grid reference). Soils are easily sampled by following the instructions in the enclosed leaflet. It is important to gain a representative topsoil sample from the field where the drain flow originates. Together these samples can be returned to us in the stamped addressed envelope provided. Sampling should only take 15 minutes to do, but please read the instructions, or see our website at: <http://www.hutton.ac.uk/phosphorus-sampling>

Any information you could provide on the field management, phosphorus inputs and cropping would aid our interpretation. Location data will be kept confidential and used only to relate the data on a regional not individual farm basis.

We hope that you will be able to assist us with this important work, and will see the benefit to both your business and the environment. However, if you do not wish to take part we would be very grateful if you could return whole package in the enclosed stamped addressed envelope.

Yours sincerely,

Marc Stutter, Head of Research Theme Managing Catchments and Coasts

(<http://www.hutton.ac.uk/research/themes/managing-catchments-and-coasts>)

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Field data sheet

Any of this information you could supply would greatly aid the sample interpretation. Thank you.

Sampling time					
Date		Time			
Location					
IACS field identifier number (Or OS format grid reference)					
Field drain information					
We are aiming to sample drains only capturing soil runoff. How certain are you that the drain DOES NOT receive any other inputs from yard and steading runoff, septic tanks, roads etc? (tick if appropriate)					
<i>Probably</i>		<i>Not sure</i>		<i>Certainly not</i>	
Nature of the drain pipe					
<i>Plastic pipe</i>		<i>Clay pipe</i>		<i>Approx. age</i>	years
Flow rate at sampling time					
<i>In spate</i>		<i>Moderate</i>		<i>Low flow</i>	
Field management					
Crops					
<i>Crop type</i>		<i>How many years with this crop?</i>			years
<i>Is it in rotation?</i>		<i>If so, with what other crop?</i>			
Typical dry matter yield of crop if known					Kg/ha/year
Stocking rate if grassland					Units/ha
Fertilisers					
Inorganic fertiliser type 1					
<i>NPK ratio</i>		<i>Rate</i>		<i>Month applied</i>	
			Kg/ha/year		
Inorganic fertiliser type 2					
<i>NPK ratio</i>		<i>Rate</i>		<i>Month applied</i>	
			Kg/ha/year		
Organic fertiliser applications					
<i>Type</i>		<i>Rate</i>		<i>Month applied</i>	
			Kg/ha/year		
Any other management activities in the field in the last month?					
Name and address for return of sample data					
Name					
Address					

A. Drain flow sample

What the pack contains

- Plastic syringe with attached filter
- One clear sample bottle (for unfiltered drain water)
- One black sample bottle (for filtered drain water)

Phosphorus consists of dissolved and particle forms. In this sampling method we ask you to provide a sample of the dissolved and particle forms by directly sampling in one bottle, and a sample of just the dissolved form by sampling.

Instructions

1. When you are at the sampling location remove the plastic syringe and two bottles from the packet. One bottle is clear and the other is black.
2. Fill the **CLEAR** bottle directly with drain water. Then tightly cap the bottle.
3. Pull off the filter from the end of the syringe, withdraw the syringe plunger and refit the filter by pushing on tightly.
4. Fill the syringe body with water from the drain, swill and tip it out once, refill to the top of the numbers.
5. Replace the plunger, open the lid of the **BLACK** bottle and using the plunger, push the water in the syringe gently through the filter into the bottle.
6. This should have filled at least half the bottle. If not, repeat steps 3 onwards again.
7. Tightly cap the bottle and return BOTH bottles in the envelope provided with the field data sheet. Dispose of the syringe.

B. Topsoil sample

What the pack contains

- A larger plastic bag to sample into and enable mixing the sample
- A smaller plastic bag to subsample into and send by post back to us

The soil should represent the field being drained by the sampled field drain. Soils are naturally variable so collecting a representative soil sample requires sampling a number of locations across the field, then mixing these together. We only require about 200 g of soil, so a smaller subsample should be returned to us.

Instructions

1. Use a trowel or spade to sample topsoils below the surface vegetation layer down to about 7 cm depth. At each location take small samples (about the size of a Mars bar).
2. Walking in a W shape, sample from ten locations across the field (or approximately the area captured by the drain for a large field), being careful to avoid areas of potential contamination (see picture).
3. Combine these samples in the larger bag and mix by hand to make a mixture of the topsoil samples.
4. When well mixed, place about 200g of the mixed soil in the smaller bag.
5. Send this smaller sample, along with the two drain flow bottles back to us in the stamped addressed envelope provided.

