CEFN Conwy: Improving Catchment Environmental Quality through better Soil and Nutrient Management

Cyllidir y project hwn yn rhannol trwy'r Cynllun Datblygu Gwledig a gyllidir yn rhannol gan yr Undeb Ewropeaidd a Llywodraeth Cynulliad Cymru.

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Introduction

- The Conwy catchment in North Wales is of significant economic importance as it supports a number of industries (agriculture, shellfish, and tourism)
- The catchment has suffered numerous outbreaks of microbial pollution and eutrophication events; some of which is due to nonpoint agricultural sources
- The aim of the 'CEFN Conwy' project is to support farmers in the efficient management of on-farm nutrients, soil and vegetation so reducing the potential for diffuse pollution

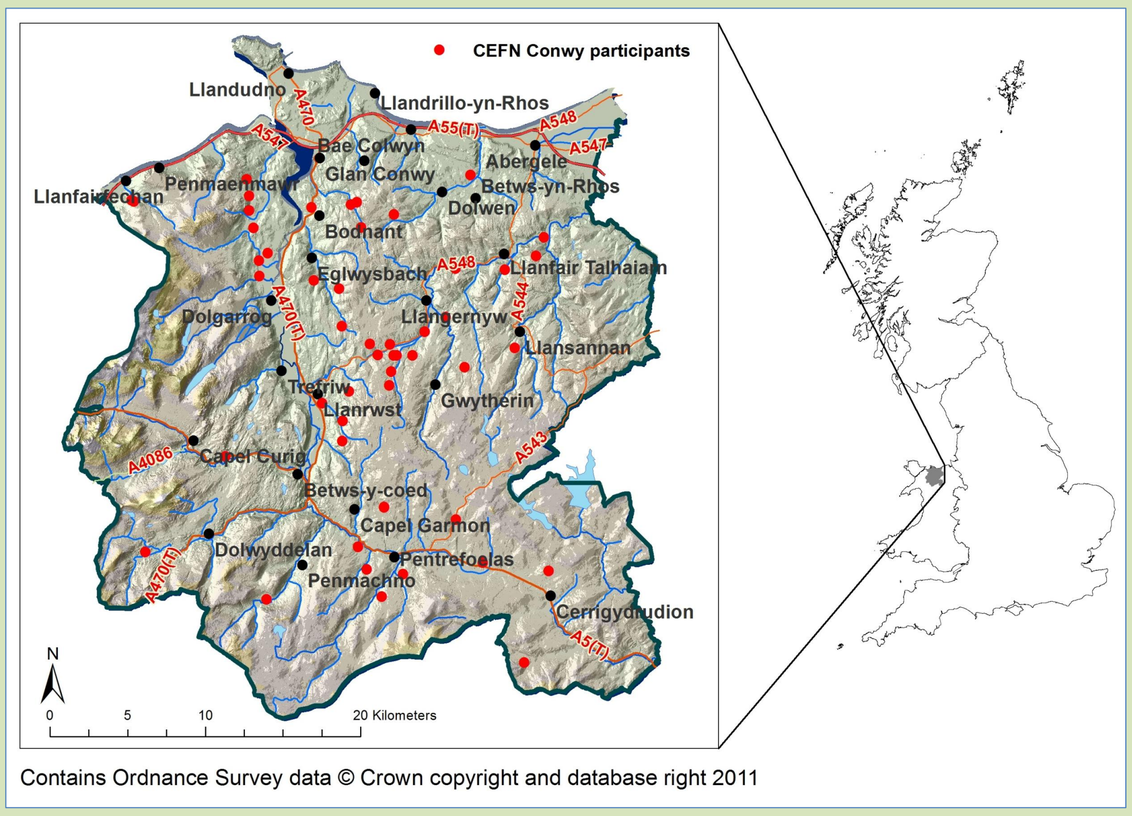

Fig. 1. *Locations of participating farms*

Methods

- Fifty farmers registered with the project (**Fig. 1**), incorporating 12% of the total agricultural land in Conwy. Farm types were representative of those within the catchment (mixed beef/suckler cow and sheep > sheep only > dairy only); mostly on improved grassland with some "ffridd" (mosaic of fragmented and diverse habitats between upland and lowland, farmed extensively)
- Farms received free soil testing (for P_2O_5, K_2O, MgO and pH) for two fields in return for taking part in an on-farm survey to collect data on imports and exports of all goods, manures and livestock in the year of 2009 (**Fig. 2**)
- These data and an empirical farm-gate nutrient model were used to estimate annual nutrient balances for each farm using the PLANET nutrient programme

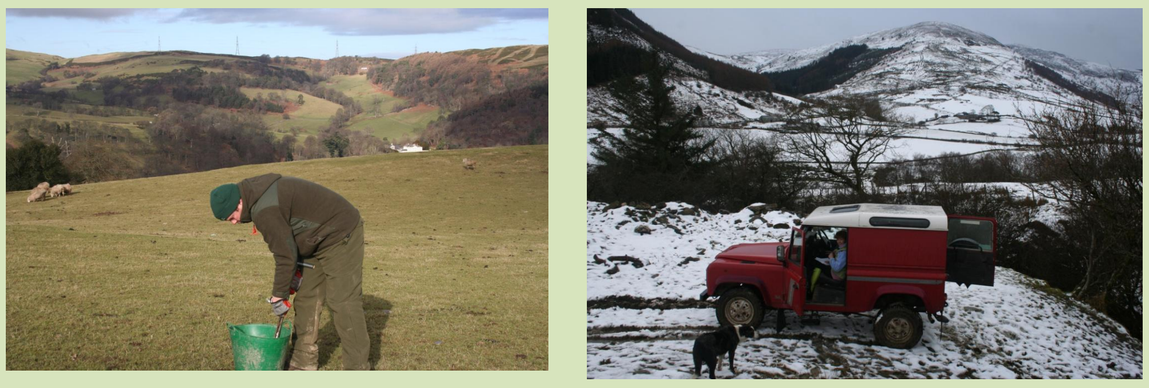

Fig. 2. *Soil sampling and collection of annual materials imports/exports information from farmers*

Results

Soil results are summarised in **Fig. 3**:

- 77% of fields were below the optimum pH 6.0 for grass production
- 77% of fields were either P index 2 or 3, with only 4% > index 3
- 35% of fields were either K index -2 or +2, with 60% < index 2

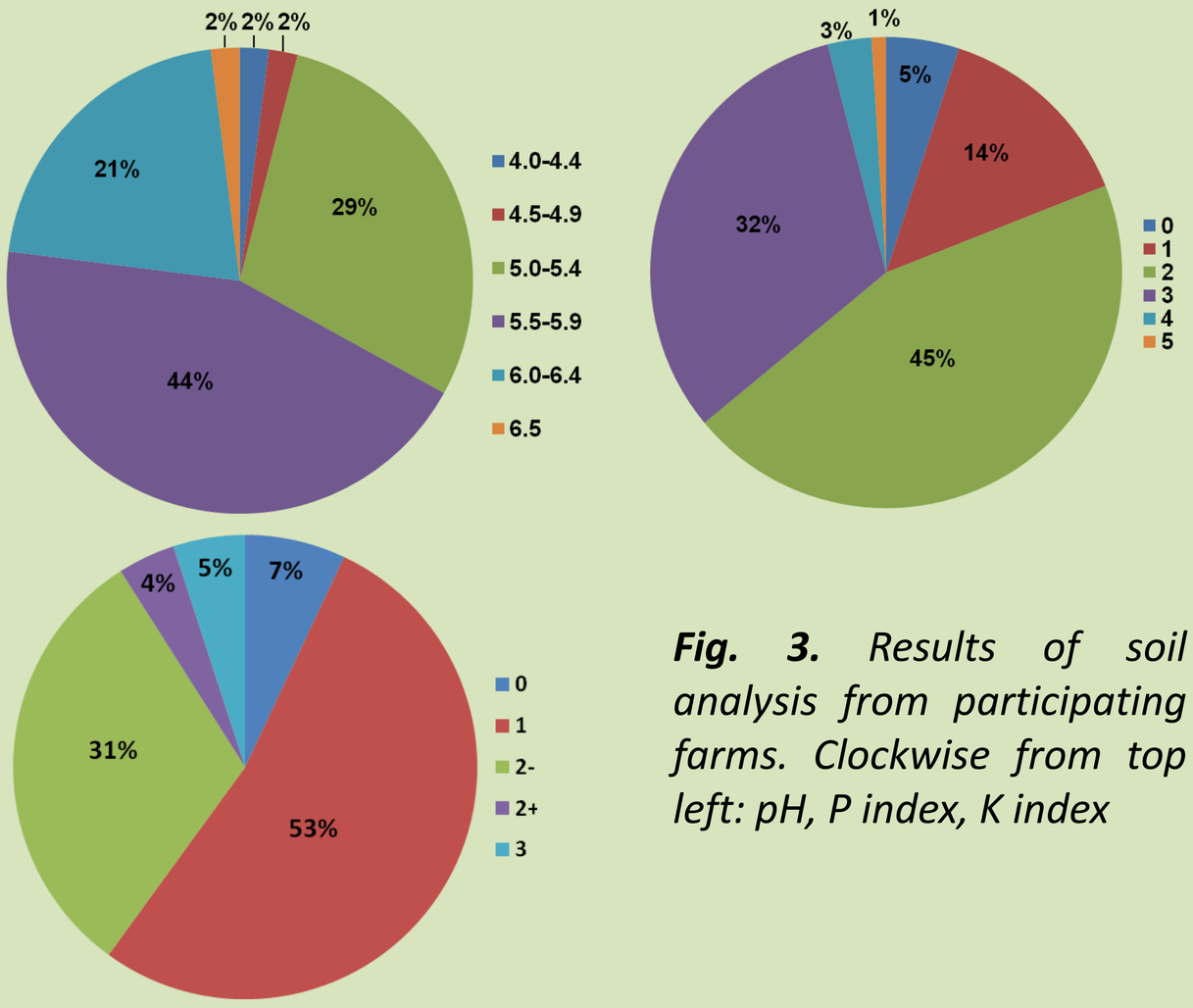

Fig. 3. *Results of soil analysis from participating farms. Clockwise from top left: pH, P index, K index*

Comparisons of mean farm nutrient balances with DEFRA benchmarks for livestock farms (**Fig. 4**) showed that:

- N balance was +104 kg ha^{-1} (median +97; range +26 to +189)
- P_2O_5 balance was +8.0 kg ha^{-1} (median +6.5; range -0.9 to +26)
- K_2O balance was +18 kg ha^{-1} (median +15; range +0.9 to +45)

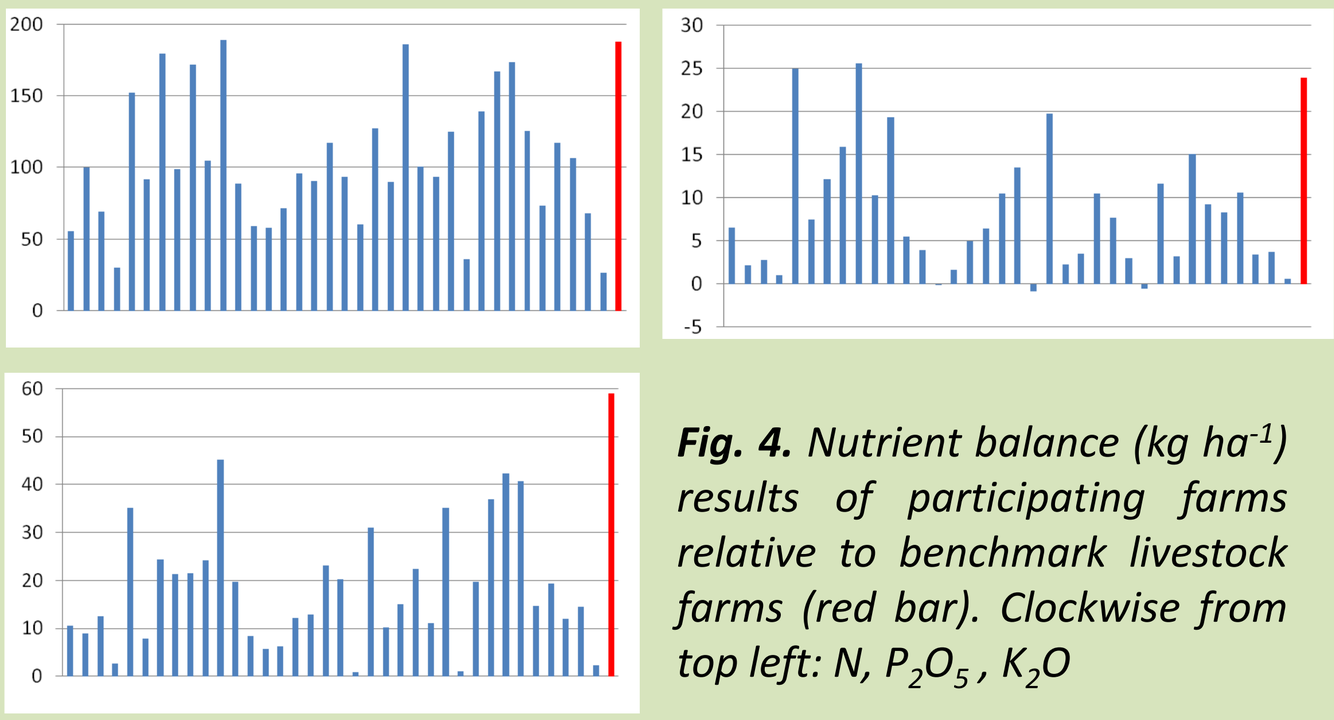

Fig. 4. *Nutrient balance (kg ha^{-1}) results of participating farms relative to benchmark livestock farms (red bar). Clockwise from top left: N, P_2O_5 , K_2O*

Conclusions

- Soil acidity and available potash are limiting production in Conwy
- Estimated mean nutrient balances are comparable to DEFRA benchmark estimates for similar livestock farms (DEFRA report ES0124SID5, 2005)
- Eutrophication events more likely relate to improper timing of fertilizer and/or organic waste application, not necessarily over-application of nutrients