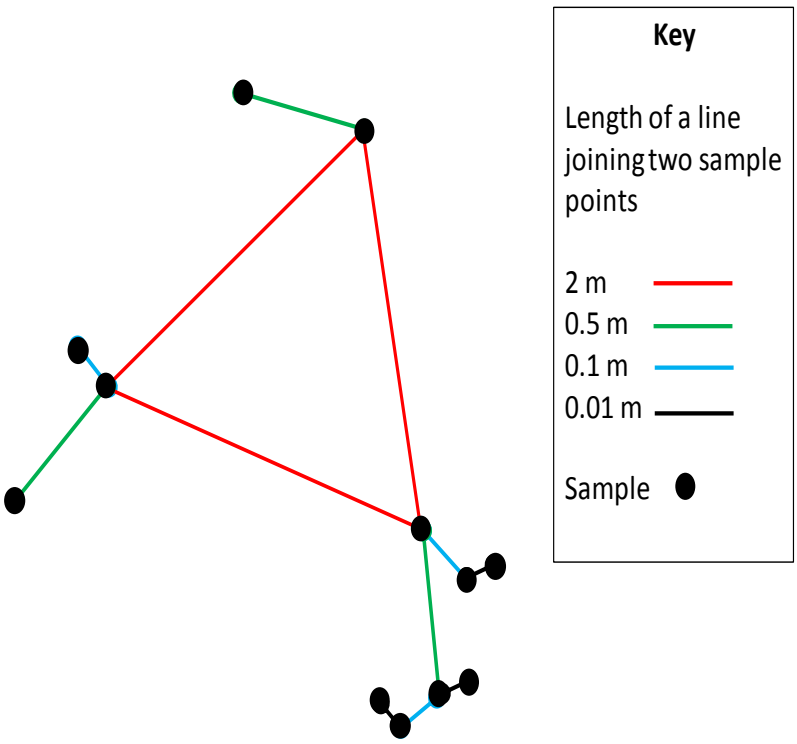

Fig. 1. The optimised sampling design of a mainstation. Distances between sampling points were fixed but angles were randomized, with the exception of the 2 m vectors.

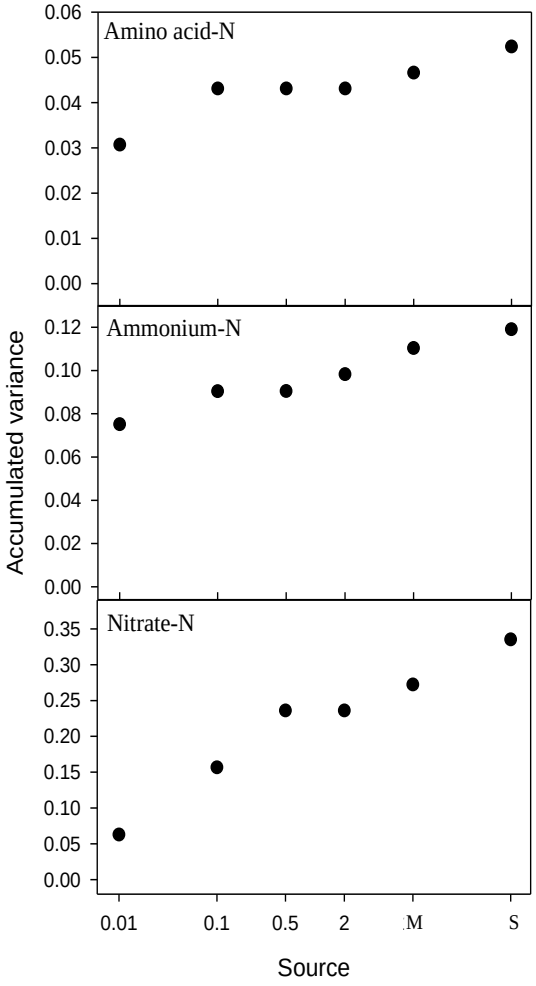

Fig. 2. Accumulated variance components from the finest to coarsest spatial scale, derived from 5th and 6th June nested sampling results (before fertiliser addition). Source is the spatial-component in meters, with M and S representing the between-mainstation and between-strata components respectively.

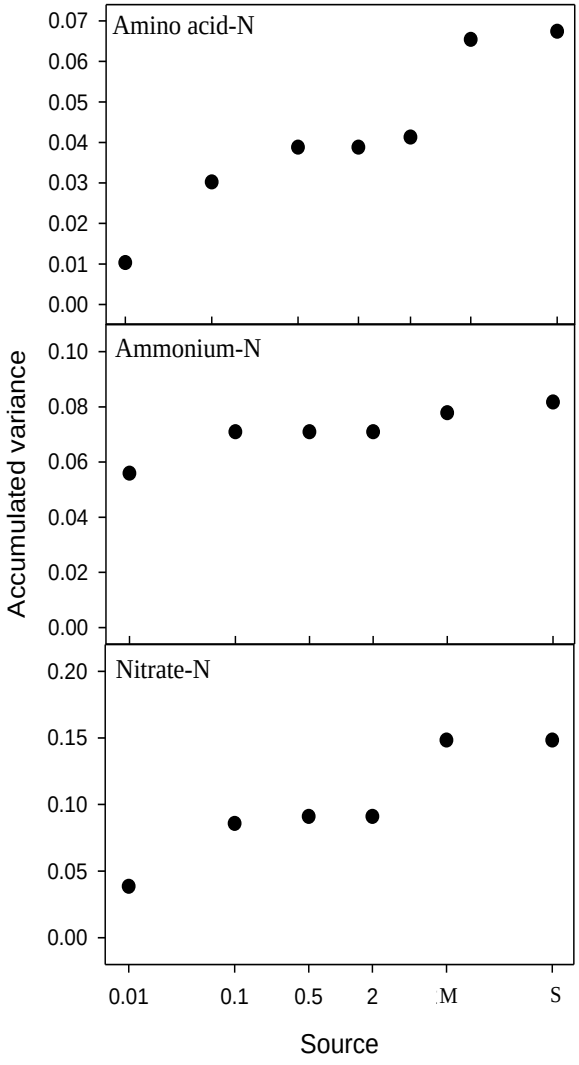

Fig.3. Accumulated variance components from the finest to coarsest scale, derived from 31st July and 1st August nested sampling results (after fertiliser addition). Source is the spatial-component in meters, with M and S representing the between-mainstation and between-strata components respectively.

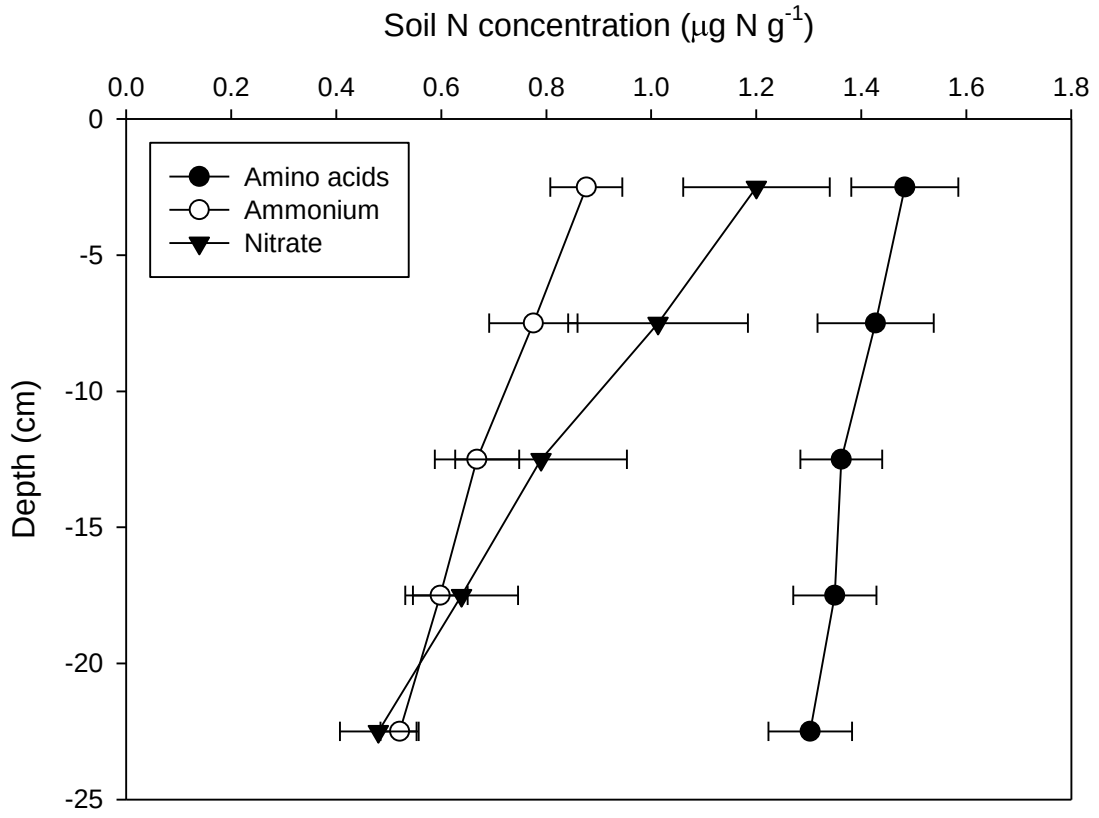

Fig. 4. Variability of amino acid-N, ammonium-N and nitrate-N with soil depth. Data points represent means ± SEM (n = 12) of soil N concentrations for each 5 cm depth increment.

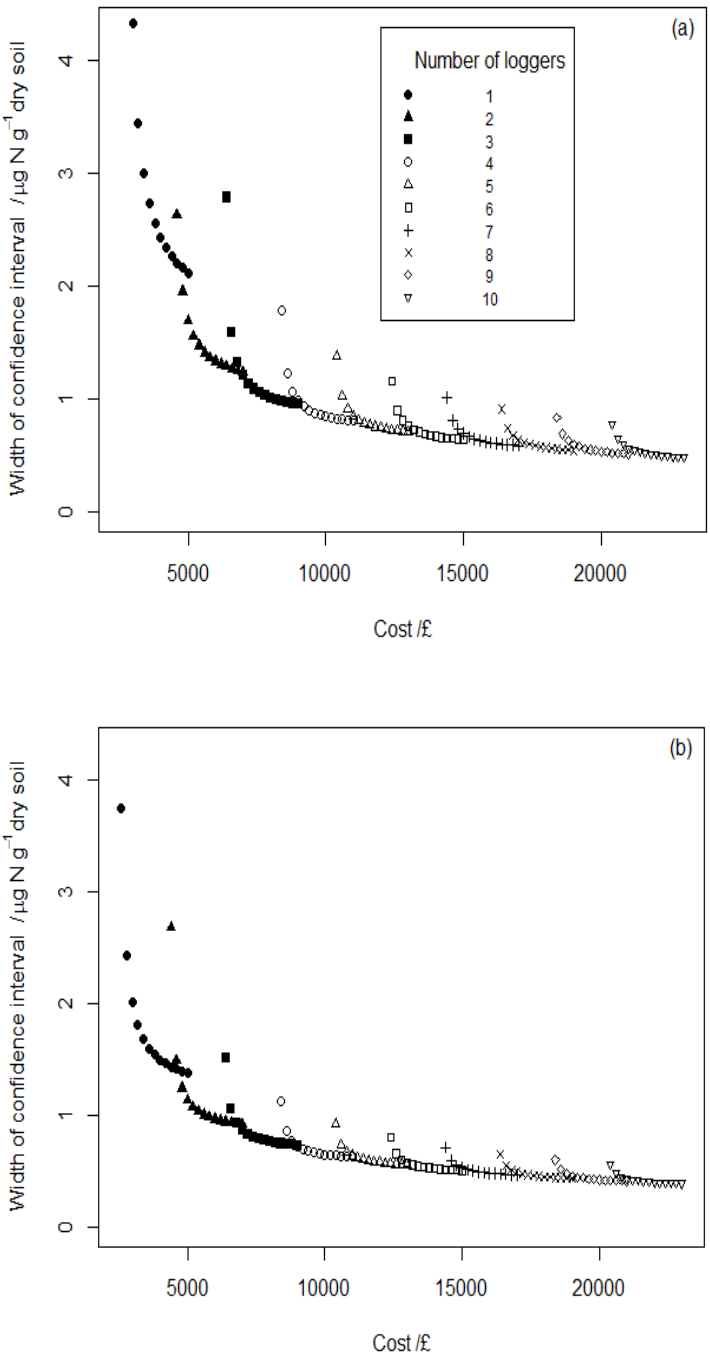

Fig. 5. Width of the 95% confidence interval for alternative sensor arrays of different cost computed from variance components from nested sampling of nitrate N in (a) June (before fertiliser addition) and (b) July-August (after fertiliser addition). Note that the arrays comprise 1–10 loggers and a maximum of 15 sensors per logger. To allow a common range of values on the ordinates of these graphs, and to facilitate interpretation, arrays with fewer than five sensors in total have been excluded from Figure 5(a) and arrays with fewer than three sensors have been excluded from Figure 5(b).