

N 508491CR
101069 AS

CEH Lancaster
Archive Copy
Please do NOT remove
Not for loan

Module 6: Soils and Pollution

MASQ: MONITORING AND ASSESSING SOIL QUALITY

November 1998 Progress Report.

Objective

To obtain nationwide datasets on the distribution of soil fauna, microbial diversity, heavy metal content and organic pollutants in Great Britain. Countryside Survey 2000 (CS2000) provides a cost-effective framework for integrating a soil biological survey with existing and subsequent soil and land use data. A programme of sampling by the field surveyors operating under CS2000 would provide suitable soil material for subsequent laboratory evaluation of faunal diversity and microbiological status. This sampling would be targeted to enable field surveyors to re-sample points used in the 1978 survey; ca. 1260 soil samples with data on pH, loss on ignition, basic soil descriptions.

Preparation prior to the field survey

Before the field survey commenced, three short-term staff, supervised by Dr's Black and Ineson, prepared all the necessary equipment and protocols. The final protocol was incorporated in the CS2000 sampling handbook in early May. Dr Ineson demonstrated the protocol to the CS2000 surveyors at the CS2000 Training Course. A two core-size soil sampling protocol was adopted to ensure continuity in sample size, minimise soil disturbance for faunal assessments and support a consistent sampling protocol. For soil faunal and microbial/organics samples, two paired samples would be taken using 8 cm long x 4 cm wide plastic cores. Cores for soil chemical analyses would be taken at the same location as the soil biota cores using a plastic core of 15 cm x 5 cm, to be comparable with soil samples taken in 1978.

A field sampling kit was prepared for each survey team that consisted of sampling items additional to those already in the CS2000 field kit. Each team leader was issued with complete packs for all squares to be sampled in their area. Each pack contained stamped addressed envelopes to ITE Merlewood for each X plot which also contained two white cores plus plastic stoppers in labelled plastic bags, one each for faunal and microbial samples, and a black plastic core for the soil chemistry sample.

Laboratory space: A large store at Merlewood was renovated to provide the necessary space

for processing, extracting and storing the large number of soil samples expected from CS2000. This required a substantial amount of work to up-grade the electricity supply and install suitable benching and storage facilities for a large number of preserved specimens.

Soil faunal extraction equipment : Tullgren funnels (72 in 6 x 12 banks) were purchased from Burkhard Scientific who produced them as a special order for Merlewood to ensure that the equipment was ready for the survey start date. These funnels are now housed in the dedicated lab. and used in the dry extraction of soil mesofauna. Standard dry extraction protocols were tested in May 1998 and modified to ensure optimum extraction efficiency from each core.

Soil Microbial Cores: A processing and storage protocol was developed along with the soil faunal protocols, since these two cores should arrive at the same time. A minus 87°C freezer was purchased for the storage of CS2000 soil cores for microbial assessments.

Collection of field samples by CS2000 surveyors

The majority of samples have now been collected by the field surveyors and returned to ITE Merlewood. Each field team followed the prescribed protocols and returned the samples with the required haste. The status of the field survey was regularly communicated to this project by the ITE survey coordinators.

Processing of samples at ITE Merlewood

Since May 1998, two short-term staff have processed field samples as they arrived at ITE Merlewood. A part-time staff person has co-ordinated day-to-day project matters and the input of new data onto spreadsheets. To date all work has been carried out as planned and the final soil chemistry samples are currently being processed for analyses. All soil faunal and microbial soil samples have been processed and stored.

Deliverables

1. Table 1 indicates the total number of samples received.

Table 1. Soil cores received by ITE Merlewood to date (4 Nov 1998)

CORES	Fauna	Microbial/Organics	Chemistry
-------	-------	--------------------	-----------

TOTAL	994	994	993
-------	-----	-----	-----

2. Protocols for sampling soils for biotic and chemical analyses as part of CS2000 were incorporated into the CS2000 field handbook and protocols for processing, extracting and storing soils for biotic and chemical analyses were produced and issued to all staff involved in the processing.
3. The wet pH has been determined on all soil chemical samples in Table 1. Over 80% of the data have been entered on an EXCEL spreadsheet. Dry pH has been determined in over 80% of these samples.
4. Over 75% of the soil chemistry cores in Table 1 have been air-dried, sieved through a 5 mm sieve and stored in plastic pots for further analyses.
5. Soil fauna have been extracted from all faunal soil cores in Table 1 and stored in 70% ethanol for identification.
6. All microbial cores in Table 1 have been frozen.