

## Soil ecological studies of decomposition of urban fertilisers

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### Background

It is likely that organic farms will receive an increasing amount of urban fertilizers because 1) there is a demand for recycling of nutrients from cities, i.e. to produce urban fertilizers and that 2) organic farms might be the main recipients of these fertilizers to supplement the input of organic nutrients.

There is a need to investigate the effects of different types of fertilizers in regard to general biological effects on the soil and among these mineralisation and immobilisation of nutrients.

### Objective

1. To quantify the temporal course in the decomposition of urban fertilizers in agricultural soils using C & N fluxes and mass loss.
2. To determine the quantitative contribution from the trophic levels in the food-chain using:
  - a. -Simple methods (mass loss, microbial biomass and faunal abundance)
  - b. -Isotope techniques and molecular markers.
3. To investigate the temporal course in the contribution of the trophic levels with an emphasis on the role of microarthropods.

### Progress – 2004

I have stayed at DMU, Silkeborg since Oct 2004.

In February I arranged a mini-workshop at KVL called "Energy flows, food webs, and plant health".

Link: <http://www.agsci.kvl.dk/nutrap/Dansk/CRstatus.htm>. The workshop expanded my network and the contacts I have made have been very useful.

I followed the course Advances in Plant Nutrition B (18 ects) at KVL S2004 and an assignment based on literature studies on plant uptake of organic nutrients will be submitted Nov 1. Two SOAR summerschool courses have been attended.

Currently two experiments are in progress.

1. Isotopic fractionation and temporal equilibrium in soil microarthropods (laboratory study)
2. The influence of Collembola on nutrient release and plant uptake of organic nitrogen (plant mesocosm study)

The experiments will be finished in November and analyses are expected to be ready in Feb 2005. A poster “Isotopic fractionation and temporal equilibrium in soil microarthropods” with preliminary results was presented at XIVth International Colloquium on Soil Zoology and Ecology.

My work in 2004 has been specifically aimed at implementing isotope techniques in order to use these techniques in subsequent experiments with urban fertilizers.

### **Plans - 2005**

From Nov. 2005 I will stay at KVL for a minimum of 6 months.

To submit three publications

1. The manuscript “Integrating foodweb dynamics with nutrient and energy flows in soil: exploratory trials with composted and degassed municipal sorted waste” – to be submitted Dec. 2004.
2. Isotopic fractionation and temporal equilibrium in soil microarthropods (laboratory study) – May 2005
3. The influence of Collembola on nutrient release and plant uptake of organic nitrogen (plant mesocosm study) – June 2005

During my stay at KVL I plan to begin composting urban fertilizers and experiment with other types of urban fertilizers. The fertilizers will be used for another mesocosm study medio 2005 at DMU.

A stay at a foreign university is planned in the end of 2005 for a period of 6 months. We have not decided where it will be yet.

### **Publications**

None