

## **ANNEXE I**

### **REPORTS OF SESSIONS AND ROUND TABLES**



**REPORT OF SESSION 1:****NUTRIENT AND CARBON CYCLING IN SUSTAINABLE PLANT-SOIL SYSTEMS**

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This first session got the conference off to an excellent start in this very important topic area. The importance of the session was reflected by the total of 54 papers, comprising 9 oral and 45 poster presentations. These papers included a number of presentations covering major nutrient recycling (from a range of waste types), a large number on MSW composts, carbon recycling and sequestration, soil physical fertility and soil structure, other non-agricultural residues, (e.g. meat and bone meal, sugar beet lime residues, sludge from fish farming, waste water from olive oil production), composted urban wastes as a growing medium, sometimes with overlap of topic area within individual presentations. The high quality of the oral presentations was reflected by the level, and number, of questions in the short discussion period following each of the papers.

The keynote address by Ed Stentiford on “The importance of agriculture in global waste” highlighted particularly the problems facing all of us in terms of the role of wastes in greenhouse gas emissions, posed a number of challenges and raised some thought provoking questions. Even the EU, rich in technology and resources, recently (2001), presents a disappointing scenario, with uncontrolled emissions from an average of > 30% of landfill sites, a statistic likely to degenerate further with the accession of 10 new States into the EU. The 4 billion people in the ‘rest of the world’, commanding relatively few resources, present a massive problem because of uncontrolled dumping of putrescible waste which result in significant emissions of CH<sub>4</sub>. Nevertheless this also presents a great opportunity for improvement in global emissions, demonstrated by small community projects, in southern American countries, in which some separation of wastes, followed by composting and beneficial recycling allows the generation of some income, improvements in health and significant savings in greenhouse gas emissions.

A wide range of issues were explored and a wealth of interesting information was presented within the 8 other platform presentations within this session. Despite the sometimes rather negative perception of composting as likely to increase gaseous and other emissions, it is clear that the process can make a significant contribution to sustainable agriculture by stabilising certain “waste” materials and enhancing the storage of soil C. During the discussion of the platform presentations, the importance of evaluating and demonstrating the economics (both costs and benefits, as appropriate) was emphasised.

J. Laws - A nutrient budget approach for estimating apparent N and P surplus on commercial farms and, hence, potentially N and P excretion in livestock (in this case dairy cows) provided data which was generally supportive of the N standards currently in use in the UK. However, the less well-established P standards appear likely to have been over-estimated and require re-evaluation. The robustness of the fertiliser data was questioned but the approach appears to offer a useful way of evaluating these standards which are of great importance for the viability of livestock farming within the requirements of environmental regulations.

S. Houot – An index of biological stability (IBS) was used to compare the impacts of different urban composts on the soil organic carbon pool and the mineralisation and immobilization

of organic C and the application of a French model was able to show the success of this IBS.

E. Ceotto – An interesting approach in which pig slurry was applied at high rates to alfalfa with apparent benefit for C sequestration and, surprisingly, utilisation of slurry N reduced risk of nitrate leaching.

S. Bittman - Field experiments conducted in Canada, on the application of pig slurries with surface-banding technique were able to show a significant yield benefit in comparison with surface broadcast application and very promising potential for reduction in ammonia losses.

M. Annabi – The paper concerned the impacts of urban composts on soil physical stability as well as soil organic C.

P. Peu – The presentation covered the residual phase of the “SOLEPUR” experiments which studied the soil treatment of very high rates of pig slurry application over 5 years. The residual phase of 6 years has shown an accumulation of P and K. However, despite the downward movement of soil P, no leaching of P was observed and while exchangeable K decreased, K concentrations in drainage water remained high.

H. Akerhielm – Source separated, anaerobically digested food waste was applied as a nutrient source in cereal production with results comparable to those of cattle slurry. They concluded that this residue could replace mineral fertilisers with a surplus of N and small deficit of P (which is a useful bonus compared with animal manures).

M.A. Bustamante – Various residues from wine production which are problematic for small producers who are unable to send to distilleries were successfully applied to 3 soil types as source of C and N. The beneficial impacts were greater for the sandy soil than to the clay or loamy soils. In general a reduction in N mineralisation occurs although there was an increase in soil biological parameters.