Soil Management

Soils play a key role in regulating the cycles of carbon, water and nutrients on our planet. Farmers, in managing their soils, traditionally aim to steer these cycles towards maximum **productivity** of inputs (land area, labour, water, energy, nutrients, etc.). Today, **mitigation of climate change** and the long term care for **soil quality** have become equally important. Optimum soil management, therefore, must strike an optimum between all these goals.

What is soil management ? The farmers' toolbox comprises a wide array of strategic, tactical and operational practices, that can be grouped into categories:
- **water management** (e.g. irrigation, drainage);
- **crop rotation** and green manures
- soil **tillage**, residue management and weed control (e.g. conventional tillage, no tillage, reduced or conservation tillage);
- **nutrient management** and manure application (e.g. slurries, farmyard manure, fertilisers, manure separation products, composts);
- **crop protection** (chemical, integrated or biological management).

Within each of these categories, different practices can be compared for their **impacts** on productivity, greenhouse gas emissions and carbon stocks, and soil quality. This requires the selection of suitable **indicators** to express performance in terms of these goals. It also requires that **Current Management Practices** are identified as a baseline. Because soil management varies widely between the major farm types of Europe, this also holds for alternative options to improve management. Local biophysical and socio-economic conditions define the scope for adopting such options.

Best Management Practices

To achieve its overall objective, the Catch-C project will assess the farm-compatibility of **Best Management Practices** aiming to promote productivity, climate change mitigation, and soil quality. Catch-C will set up a **typology** of the main **farm types** and **agro-ecological zones** across Europe. This frame, coupled to a pan-European database of socio-economic and biophysical data, will be used for spatially organising the information collected on current management and impacts expected from changes in management.

Biophysical impacts of management practices are assessed primarily from **long term field experiments** by partners, supplemented by available literature. Produced overviews of Best Management Practices will include trade-offs and synergies between productivity, climate change mitigation, and soil quality.

A key activity is the identification of **barriers against adoption** of Best Management Practices, and the formulation of ways to remove these. Farmer views on Best Management Practices are collected by surveys in all participant countries. Catch-C assesses costs and benefits of practices; and identifies technical and ecological bottlenecks that prevent adoption. Results are integrated into a decision support tool for farmers, and include a list of innovations required to address issues that currently hinder adoption of better practices.
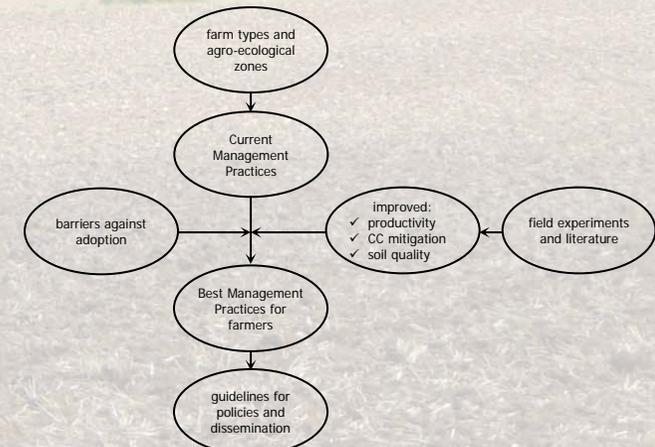
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Objectives:
Identifying and improving the
farm compatibility of sustainable
soil management practices for
farm productivity, climate-change
mitigation, and soil quality.
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From Science to Farms and Policy

Policy measures can promote adoption of Best Management Practices in various ways, such as voluntary measures, regulation, and economic incentives. Actively involving policy makers, Catch-C will develop **guidelines for policies** that will support the adoption of such practices; and that are consistent with regional agro-environmental and farming contexts.

Dissemination to the farmers and policy communities is an essential part of the project, besides scientific publication. Project results on Best Management Practices and their feasibility in different farm types and environments will raise awareness about the pros and cons of management and policy options. Farmers and policy communities will be reached via workshops, brochures, trade journals and web-based tools.

Figure: The concept of Catch-C

Catch-C

Compatibility of Agricultural
Management Practices and Types
of Farming in the EU
to enhance Climate Change
Mitigation and Soil Health

Team

Stichting Dienst Landbouwkundig Onderzoek,
Wageningen, The Netherlands
Lead: Hein ten Berge

Austrian Agency for Health and Food Safety, Vienna,
Austria
Lead: Heide Spiegel

Centre d'Etude du Machinisme Agricole du Génie Rural
des Eaux et Forêts, Clermont-Ferrand, France
Lead: Nadine Turpin

Universidád de Córdoba, Spain
Lead: Juan Vicente Giraldez

Institute for Vegetable and Ornamental Crops,
Grossbeeren, Germany
Lead: Jörg Rühlmann

Institute for Agricultural and Fisheries Research (ILVO),
Merelbeke, Belgium
Lead: Greet Ruysschaert

Institute of Soil Science and Plant Cultivation, Pulawy,
Poland
Lead: Alina Syp

Università degli Studi di Torino, Italy
Lead: Carlo Grignani

Wageningen Universiteit - Plant Production Systems,
The Netherlands
Lead: Martin van Ittersum

Georg-August-Universität Göttingen, Germany
Lead: Horst-Henning Steinmann

Università degli Studi di Milano, Italy
Lead: Luca Bechini

Instituto Andaluz de Investigación y Formación Agraria y
Pesquera, Sevilla, Spain
Lead: Karl Vanderlinden

Contact

Coordinator:
Dr. HFM ten Berge
Phone: #31.317.480569
Fax: #31.317.423110
Wageningen UR
Postbus 616
6700AP Wageningen
The Netherlands
hein.tenberge@wur.nl

www.catch-c.eu

SEVENTH FRAMEWORK
PROGRAMME