



Participant Profile

for the
Turkish-German Strategy Workshop 2006
TÜBİTAK Marmara Research Center,
Istanbul- Gebze Turkey
13 – 15 December 2006



International Bureau (IB)
of the Federal Ministry of
Education and Research
(BMBF)

**Expertise,
technologies and
infrastructures
available in your
institution:**

Research activities / expertise:

The ATB's task is to create process-engineering bases for sustainable land-use management and to provide innovative technical solutions for industry. ATB scientists and engineers develop scientifically based processes and technical solutions for

- Production of high-grade foods and feeds
- Production of renewable raw materials with intermediates and end products of defined quality
- Generation of biogenic sources of energy
- Treatment and reuse of biogenic residual materials.

Scientific and engineering findings are combined with economic and social science expertise. This ensures that the newly developed processes and technical solutions are profitable for both manufacturers and users. At the same time environmental effects are evaluated in order to promote and to enhance sustainability.

Research at ATB is focused on the general situation in the New Federal States in the East of Germany and the transferability of results to the countries of Central and Eastern Europe (CEE).

Users of the research results include the scientific community, farmers and horticulturists, their upstream and downstream sectors, and here especially the manufacturers of agricultural machinery and technical plants. This information is also used by the trade, political decision-makers, as well as the local, state and federal government.

Methods:

Studies on different energy crops on experimental fields include:

- Determination of plant available nutrients (\Rightarrow nutrient balances)
- Total elementary analyses of soils and plants by AAS
- Calculation of N mineralisation
- N_2O emissions from the soil in flux chambers
- Nitrogen leaching by the resin core technique
- Analyses of soil heavy metals by AAS
- Life cycle assessment

Key technologies:

- Bioengineering
- Biogeochemistry
- Engineering for Crop Production
- Engineering for Livestock Management
- Horticultural Engineering
- Microbiology
- Plant physiology
- Post Harvest Technology
- Social economy
- Soil physics



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Infrastructures:

The structure of research at ATB is subdivided into 3 research areas:

1. Environmentally sound and competitive agricultural production processes
2. Quality of food and feed
3. Renewable raw materials and (bio-) energy in rural areas

Further equipments:

- Raw material/energy plantation (3 ha) running since 1995
- pilot plants for the bioconversion of plant biomass to lactic acid, and for the preparation and processing of preserved natural fibre
- Biotechnological test facilities
- Chemistry laboratories (IC, GC, HPLC, AAS, TOC)
- Climate and respiration measuring laboratory
- Microbiological and a fermentation laboratory
- Geographic information systems (GIS) laboratory
- Product property laboratory
- Thermography lab
- Fluid dynamics laboratory with a test facility for milking
- Bio-fuel and emissions measuring laboratory
- Laboratory for computer-aided imaging
- Optics laboratories
- Ergonomics laboratory
- Library for technical and scientific issues
- Central workshop

Key publications:

Kern J, Reimann W, Schlüter O (2006) Treatment of recycled carrot washing water. *Environmental Technology* 27: 459-466.

Kreibich H, Kern J, Camargo de PB, Moreira MZ, Victória RL, Werner D (2006) Estimation of symbiotic N₂ fixation in an Amazon floodplain forest. *Oecologia* 147 (2): 359-368.

Kern J, Hellebrand HJ, Kavdir Y (2006) Nitrogen leaching in an aquatic terrestrial transition zone. In: Baba A, Howard KWF, Gunduz O (eds) *Groundwater and Ecosystems*: 195-204. Springer-Verlag, Berlin, Heidelberg.

Hellebrand HJ, Scholz V, Kern J, Kavdir Y (2005) N₂O release during cultivation of energy crops. *Agricultural Engineering Research* 11 (5): E114-124.

Hellebrand HJ, Kern J, Scholz V (2003) Long term studies on greenhouse gas fluxes during cultivation of energy crops on sandy soils. *Atmospheric Environment* 37: 1635-1644.

Kern J (2003) Seasonal efficiency of a constructed wetland for treating dairy farm wastewater. *Advances in Ecological Sciences* 11:197-214.

Kreibich H, Lehmann J, Scheufele G, Kern J (2003) Nitrogen availability and leaching during the terrestrial phase in a várzea forest of the Central Amazon floodplain. *Biol. Fertil. Soils* 39: 62-64.

Kern J, Kreibich H, Darwich A (2002) Nitrogen dynamics on the Amazon floodplain driven by the Solimões River. In: McClain M (ed) *The Ecohydrology of South American Rivers and Wetlands*. IAHS Special Publication no. 6: 35-47. IAHS Press, Wallingford, Oxfordshire.

Grüneberg B, Kern J (2001) Phosphorus retention capacity of iron-ore and blast furnace slag in subsurface flow constructed wetlands. *Wat. Sci. Technol.* 44 (11-12): 69-75.

Kern J, Idler C (1999) Treatment of domestic and agricultural wastewater by reed bed systems. *Ecol. Eng.* 12/1-2: 13-25.



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2. Past and present research collaborations

Are you familiar with the European Framework Programme?

Yes

No

- with Framework Programme 5
- with Framework Programme 6
- with Framework Programme 7

EU-projects you are involved in:
Past projects

Programme title / contract number / title / acronym / your function (coordinator / partner / contractor)

Present projects

Cost Action 856 "Ecological aspects of denitrification with special emphasis on denitrification" / partner

Other international collaborations:

SHIFT (German-Brazilian Cooperation, BMBF-CNPq)
Ecosystem Research in the Amazon floodplain forest from 1992-2001

Name(s) and contact details of potential partners:

If you would like to suggest the participation of particular partners from the partner country based on existing contacts or collaboration experience, you are welcome to indicate their names and contact details below:

Dr. Yasemin Kavdir, Çanakkale Onsekiz Mart University (COMU),
Agricultural Faculty, Soil Science Department,
Phone: +90286 2180018-1314; E-mail: kavdirya@comu.edu.tr

3. Presentation at the Workshop

I will give a presentation at the workshop (approx. 10 min.) to present my institution, my expertise, and my collaboration interests. The contents of my presentations is summarised below (max. 1 page).

There is an increasing interest in renewable biomass (energy crops) due to limitation of fossile fuels and global climate change. Bio-energy is one of the most important cost-effective renewable energy sources for Europe in terms of production of energy. By the production of energy crops, atmospheric CO₂ is sequestered. However, different strategies for fertilisation and other adverse effects on environment and biological resources are not well studied yet. Consequently an ecological concomitant research is required in order to receive a broad acceptance for the production of energy crops. This research includes the measurement of heavy metals and nutrients, which may pollute soil and groundwater due to fertilisation. Therefore, applied mineral fertilisers and residues will undergo a risk assessment. With respect to soil management, the soil degradation and emission of greenhouse gases will be studied. In terms of an integrated use of energy crops primarily the reuse of wood ashes is under consideration. Future scientific cooperation will be focused on a fertilisation strategy, that enables a high biomass production and a high nutrient efficiency with only little impact on the environment. Since improved environmental sustainability favors the competetive position of the production of bioenergy, farmers and enterprises should be part of cooperative and applied research. On the basis of cooperation with partners from Turkey and other European countries a European network will be developed to realise a joint EU research project within the 7th Framework Programme.

I agree with the publication of my data on the Workshop website!



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PLEASE FILL IN THIS FORM **UNTIL 22 SEPT. 2006** AND RETURN IT TO:

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