

News Release

Freising-Weihenstephan, May 5th, 2010

Environmental protection for China's agriculture Green Windows^{TUM} technology could reduce nitrogen runoff

Eutrophication is a wide-spread problem in China's lakes and rivers. In particular, the tons of nitrogen that are applied as agricultural fertilizers year after year are contributing to this disruption of freshwater ecosystems. This situation should be improved by a cooperation project of Technische Universität München (TUM) with the Universities of Braunschweig, Göttingen, and Hohenheim, funded by the BMBF, the Federal Ministry of Education and Research. 900,000 euros of the overall grant of 2 million euros will be going to TUM. The project leader is Prof. Urs Schmidhalter from the Chair of Plant Nutrition, and the project coordinator is Dr. Yuncai Hu. Project partners on the Chinese side are leading experts from universities, government agencies, and political consulting.

Although China has only about nine percent of the world's arable land, its current fertilizer consumption is 30% of the worldwide total. It is estimated that at least 20 million tons of fertilizers applied per year go to waste, polluting both surface and ground water and, at the same time, substantially adding to the climate change. The Chinese agricultural system is characterized by maximal intensity on minimal space; a typical Chinese family cultivates less than half a hectare – that is, just over an acre of land.

In order to optimize nitrogen use in China and minimize nitrogen loss, TUM researchers have developed the smart "Green Windows^{TUM} technology": This tool, which has been designed for small-scale farms in China, is backed with simplified spectral sensor systems. It shows the nitrogen supply of the plants and thus also the nitrogen balance in an easy way. Data thus gathered on the ground can be combined with information acquired by aircraft or satellites. This allows the Chinese farmers to judge the optimum fertilizer intensity for the optimum yield level. Additionally, the recently developed concept includes so-called "on-farm analyses": quick on-site testing of the soil nitrate content, which can replace expensive and complex analyses in the lab.

The Green Windows^{TUM} technology is currently being tested in China. It offers a highly efficient platform for rapid transfer into the Chinese agricultural system: The farmers can quickly adopt

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optimized strategies, opening the way to improving agricultural efficiency and increasing production while better protecting the environment.

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Image (free of charge):

<http://mediatum2.ub.tum.de/node?id=977820>

Website of the project “Innovative nitrogen management technologies to improve agricultural production and environmental protection in intensive Chinese agriculture“:

<http://www.nitrogen-management.org>

Technische Universität München (TUM) is one of Europe’s leading universities. It has roughly 420 professors, 7,500 academic and non-academic staff (including those at the university hospital “Rechts der Isar”), and 24,000 students. It focuses on the engineering sciences, natural sciences, life sciences, medicine, and economic sciences. After winning numerous awards, it was selected as an “Elite University” in 2006 by the Science Council (Wissenschaftsrat) and the German Research Foundation (DFG). The university’s global network includes an outpost in Singapore. TUM is dedicated to the ideal of a top-level research based entrepreneurial university.

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