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P r e s s I n f o r m a t i o n

Focussing the small difference Precision agriculture, key technology for future food security

The sustainable production of food in sufficient quantity and quality is a global challenge in view of the growing world population. For future food security precision agriculture is seen to be a key technology. This is the conclusion drawn by scientists from the Leibniz Institute for Agricultural Engineering Potsdam-Bornim and from University of Nebraska-Lincoln expressed in an article in Science Magazine published February 12, 2010.

Precision agriculture comprises a set of technologies that combines sensors, information systems, enhanced machinery, and information management to optimize production by accounting for variability within agricultural systems. The new production and management techniques rely on differences rather than on averages: Adapting production inputs site-specifically within a field and individually for each animal allows better use of resources to maintain the quality of the environment while improving the sustainability of the food supply. The recording of the information gained also enables to trace the production process up to each square meter of land or up to the birth of each animal.

"Smart" tractors are already operating nowadays. These machines equipped with sensors, computers and satellite navigation capture information on the state of soil and crop while driving over the field. Combining these data with spatial data allows to precisely respond to soil and crop needs with the accurately adjusted amount of fertilizer.

In the article, Robin Gebbers, scientist at the Leibniz Institute for Agricultural Engineering Potsdam-Bornim, and Viacheslav Adamchuk from the University of Nebraska-Lincoln line out newest developments for precision agriculture and emphasize its potential for food security. "It's not just about improving the profitability of farms and the working conditions for their employees. Rather, it is to use the scarce natural resources intelligently and efficiently for a sustainable production of food and agricultural raw materials and simultaneously reduce the pollution," explains Robin Gebbers. "If in the future the information gathered along the production chain up to retail is used consistently, it will be possible to enhance food production - with a minimum of waste and costs."

For example, data concerning production parameters enable farmers to identify both unnecessary and yield-boosting measures, they allow better monitoring and thus improved protection of the agricultural ecosystem, and they are essential for the traceability of food production. There are still gaps to be closed in the data communications. AgroXML, e.g., the data standard developed in Germany will facilitate the seamless exchange of information on food production among farmers, suppliers, processors, government, consumers and trade even across national borders.

Precision agriculture technologies have been applied successfully worldwide not only in agri-, horti- and viticulture but also in animal husbandry. Sensors that detect the state of health and feed requirements of each animal, for example in order to customize food rations, are widely to be found in practice.

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Robin Gebbers and Viacheslav I. Adamchuk: Precision Agriculture and Food Security

The research at the Leibniz Institute for Agricultural Engineering Potsdam-Bornim of ATB aims at resource-efficient and CO₂-neutral use of biological systems for the production of food, raw materials and energy in adapting to demands of climate and change. To this end, the ATB develops the procedural bases for sustainable land use management and provides innovative technical solutions for agriculture and industry. The institute's activities focus on sustainable, animal-friendly and competitive production processes, quality and safety of food, feed, as well as on renewable raw materials and energy in rural areas.

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