Transnational implementation of innovative crop management methods with precision farming (PA) in Germany and Brazilian agriculture by using sensors and non-invasive zoning for mapping-overlay (PA_ZONES)

First binational workshop in Passo Fundo, Brazil

source: Dr. A. Wurbs

PA_Zones is a joint project (definition phase) between Brazilian, Chinese and German scientists, research institutions and companies acting in the field of precision farming. In the definition phase is we want to analyse the possibilities for the adoption of a special PA-technique: sensor with mapping-overlay approach for the Brazilian and Chinese Agribusiness. This Study will analyse the steps to elaborate and enhance the approach for Brazilian, Chinese and German Precision Farming conditions, to validate suitability under practical farming conditions and to ensure mutual transfer of knowledge and experience between the partner countries. Steps will be determined how to implement the new PA-technology and how to analyse the expected economic and ecologic success.

The approach to couple sensors in PA with GIS-map as an ‘overlay approach’ is well studied for German farming conditions and is being served as prototypes by some German PA-companies for selected use cases (e.g.: nitrogen fertilization).
The recently available sensors are able to determine the current state of crops. To improve the efficiency of the sensor information about the actual nitrogen demand of the crops it will be combined with site specific information. Since conventional

methods like soil sampling are too costly, time and labour consuming, the sensor approach needs to be combined with non-invasive methods like existing soil maps from surveys, long-time yield mapping, satellite imagery, etc. On the basis of such offline information the online data of the sensor will be adjusted by a mapping overlay. Instead of one fertilizer recommendation curve for the whole field, several recommendation curves will be generated for different site conditions, which are aggregated to zones, within the field (Limbrunner & Maidl, 2009). Another big field for using precision farming technologies is irrigated farming systems, which will be analysed during the project with the partners from China, as one of the largest consumer of water in agricultural systems.

The implementation of such progressive variable-rate applications may improve crop yield and quality as well as the efficiency of fertilizer use or crop protection products within fields. Thus the impact onto the environment can be reduced by smaller amounts of fertilizer.

Furthermore precision irrigation systems system have the ability to apply the right amount of water directly where it is needed, while saving water through preventing excessive water runoff and leaching.

In the large scale, PA will automate management tasks, allowing to farm land more economically with the same equipment by reducing skip and overlap, as well as respecting environmental sensitivities. The data generated by PA and organized by platforms facilitates the quality control of farm operations.

The outcome of this project and necessary working capacities will be documented in a full proposal for the CLIENT call.

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