Information Systems for Farm and Machinery Management

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The managerial tasks for agriculture are currently transforming into a new paradigm, requiring more attention on the interaction with the surroundings (e.g. environment, public entities, documentation of quality and growing conditions). Recently, many advances in farm machinery have enabled them to acquire a large number of data through the ISOBUS component about tractor and implement status and performance. The connection between the ISOBUS component and precision agriculture operations is a challenge and it will open up a wealth of information for better management of crop production. The aim of this presentation is to present an analysis and design a farm machinery management information system to handle tractor and implement data together with the interactions with their surroundings. Soft systems methodology was used to analyse the human activities and to identify user requirements, while a hard systems methodology was used to structure the data handling between the tractor and the surrounding environment. The soft systems methodology was employed where a rich picture of the whole system was developed and from that a conceptual model that infers to daily operations with the tractor, implement and their surroundings. The empirical data was gathered with personal interviews with tractor drivers and farm managers on the optimal use of farm machinery data and tractor and implement performance in Greece and Denmark. The resulting management information system included apart from tractor and implement performance management, energy analysis for the farm machinery and the interrelationships between spatio-temporal data and farm machinery data. Two case studies with the application of farm machinery information management for optimizing fuel consumption for tillage operations and estimating working efficiency in collecting biomass residues are presented.