View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Copenhagen University Research Information System

UNIVERSITY OF COPENHAGEN

Economic profitability of precision farming, auto guidance and controlled traffic farming systems

site specific informaition management in cereal cultivation

Tavella, Elena; Scavenius, Inger Marie Kirketerp; Pedersen, Søren Marcus

Published in:
GeoFARMatics International Conference 24th–26th November 2010 Cologne, Germany, Book of Abstracts

Publication date:
2010

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Tavella, E., Scavenius, I. M. K., & Pedersen, S. M. (2010). Economic profitability of precision farming, auto guidance and controlled traffic farming systems: site specific informaition management in cereal cultivation. In *GeoFARMatics International Conference 24th–26th November 2010 Cologne, Germany, Book of Abstracts: Geo-Information, Farming Informatics Management and Agribusiness* (pp. 86)

Download date: 08. apr.. 2020

Economic profitability of Precision Farming, Auto Guidance and Controlled Traffic Farming systems

Site specific information management in cereal cultivation

E. Tavella, I. M. K. Scavenius and S. M. Pedersen

This study analyse the economic profitability of selected Precision Farming technologies and Controlled Traffic systems at farm scale. The selected PF technologies are site specific management of weed, lime and nitrogen as well as auto guidance.

In order to find the economic profit two steps are applied for each technology: First, the economic benefits are analyzed by calculating the expected yield potential or cost saving from implementing each PFtechnology compared with conventional practices. The calculations are based on production data of winter wheat cultivation from the Lower-Austrian region in the case of site specific weed, lime and nitrogen management as well as Controlled Traffic Farming. In the case of auto guidance the data are based on Danish conditions. Second, the costs of implementing new precision farming technology are based on the annual machinery cost for a 500 hectare model farm. Benefits rely on literature review for the various technologies and recent farm trials with PF technologies in Europe and other regions.

Findings from this study indicate that it should be possible to save inputs by using advanced PF technologies (e.g. herbicide, lime, nitrogen, seed, energy and working hours). In addition it may be possible to increase yield rates for site-specific lime and nitrogen management. For CTF systems it seems possible to reduce overlaps with Auto Guidance. However, the availability of practical feasible technologies shows differences: for site-specific weed management there is still a need for autonomous weed detection systems with real time sensors and for variable rate N-application there is still a lack of reliable decision support. On the other hand Auto Guidance and CTF systems seems to be well proven technologies in practice and economic viable with relative large farm sizes. For many of these systems there are significant costs related compared with conventional systems which imply that only some of them are economic attractive.

GeoFARMatics

International Conference

24th – 26th November 2010

Cologne, Germany

Geo-Information, Farming Informatics
Management and Agribusiness

Book of Abstracts

Keynotes
agriXchange
CAPIGI
FutureFarm
Pecha Kucha
Poster

Imprint:

The material in this book of abstracts has been supplied by the authors and has not been corrected by the Scientific Programme Committee of the GeoFARMatics 2010. The abstracts represent the options solely of the authors. The authors are responsible for the content of their abstracts in this book. In particular, neither the Scientific Programme Committee nor any organization or body sponsoring this meeting can be held responsible for any material reproduced in this booklet.

Scientific committee:
Simon Blackmore (CERETETH, Greece; UniBots, Great Britain)
Martin Kunisch (KTBL, Germany)
Tamme Van der Waal (Aero Vision, Netherlands)
Guy Waksman (Acta Informatique, France)
Armin Werner (ZALF, Germany)
Sjaak Wolfert (WUR, Netherlands)

Version as of 15th of Jan. 2011.
Please check www.GeoFARMatics2010.org for updates.

Prepared by ZALF, Gernany:
editorial work: Viola Kannemann

Reponsible according to the German press law
Armin Werner, ZALF
Copyright: ZALF

Contents

Introduction **5**

Foreword *6*

The EU-coordination and support action agriXchange *7*

The community network CAPIGI *9*

The collaborative EU-project FutureFarm *10*

Keynotes **12**

View of the Software industry *13*

Farm Management Information Systems, precise applications of agro chemicals and adjusted, optimized dosage with help of Decision Support Systems and Geo based application techniques *14*

Progress on AG-ICT and Geo-Information in Research & Development: EU-Projects and Networks /agriXchange/ *15*

SPACE …. The Next Frontier …. *19*

FutureFarm: The European Farm of Tomorrow *20*

agriXchange **22**

Meta Knowledge Base – the support tool for successful knowledge exchange and networking within the ERA-NET ICT-AGRI *23*

CAPIGI **25**

Creation of high resolution soil parameter data by use of artificial neural network technology (advangeo®) *26*

RapidEye – From Satellite to the Field *27*

From Satellite to Tractor – TalkingFields services for Precision Farming *28*

Field geometry, auto steering and services *29*

LandCaRe-DSS – an interactive model- and GIS-based information and decision support system for climate change impact assessment and adaptation of agriculture to climate change *30*

10 steps to a successful agricultural ICT, integrating horizontal and vertical chain partners (advisors, cooperatives, industries, business partners) needs *34*

Sensor platform and UAV for multiple, simultaneous measurements in Precision Farming field trials *36*

Direct exchange of geo-information between administration and farmer *37*

FutureFarm **38**

Knowledge Management in the FMIS of tomorrow *39*

Technical architecture of the FutureFarm prototypes *42*

Implementation of an integrated FMIS client for rules servers *43*

Case: Precision fertilising with automatically validated compliance to agricultural production standards *44*

Information flows in decision making for field operations *46*

An Analysis of Agricultural Standards *51*

A survey of farm information management and precision farming systems in Europe *53*

Assessing the potential of Precision Farming Technologies in the European Union *54*

Fleet Management: Literature Review and Assessment of Potential Savings *55*

Energy flows in Agriculture and on-farm biofuel production and use *63*

Trajectory Tracking Control Algorithms and Localization Methods for Off-Road Mobile Robots *57*

Demonstration of the state-of-the-art in agro-robotics *67*

Pecha Kucha **68**

Specifications Requirements for a Farm Portal *69*

Spatial data quality – accuracy issues for site-specific land management *71*

A Viewpoint toward Applying ICTs in Sustainable Rural Development in Iran: Situations and Problems *72*

Dissemination of ICT Research Results in the Hungarian Agriculture *73*

QMS, Quality Monitoring System *76*

Specify safe new practices as decision workflows *79*

PestScout – a generic system for crop protection *81*

The Synergistic Control Concept – Intelligent Monitoring for Fact-based Management Support *84*

Economic profitability of Precision Farming, Auto Guidance and Controlled Traffic Farming systems *86*

Poster **87**

AXIO-NET FarmRTK: Precision Farming without limits *88*

Strengthening information and communication technologies – The ERA-Net ICT-AGRI *89*

ICASD – International Center for Agro-Informatic and Sustainable Development *90*

On-the-go soil sensing and the future of precision agriculture – Results of field measurement in FutureFarm farms *91*

Differential responses in water use efficiency in three Iranian wheat cultivars under drought stress *96*

Differential agronomic responses of bread wheat cultivars to drought stress in the west of Iran *97*

The effects of drought stress on yield and biochemical parameters of three Iranian wheat cultivars *98*

DSS for fruit harvest *99*

List of the Autors **100**