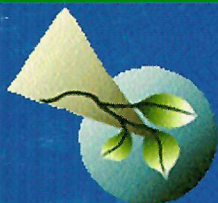


QUENTIN RAND



Seventh International Conference on
PRECISION AGRICULTURE
Conference Program

T H E M E S A N D A C T I V I T I E S

A to Z for Practitioners
Crop Quality
Education/Outreach
Engineering Technology
Environment
Exhibits
Geostatistics/Sampling
Industry Updates
Information Management
Modeling
Natural Resources Variability
New Applications Worldwide
Precision Management
Profitability
Remote Sensing

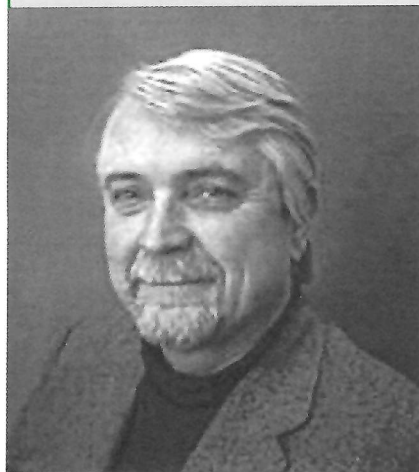
"Its [Aerial photography's] most beneficial aspect is the progressive development of a farm information system containing precisely located natural and cultural data... Such improvement could come, for example, from adjusting seed density, herbicide control, or fertilization in response to detected field problems."

Pierre C. Robert, Ph. D. Thesis, 1982

July 25-28, 2004

Hyatt Regency -- Minneapolis -- Minnesota -- USA

Seventh International Conference on PRECISION AGRICULTURE



To highlight the latest significant research and its application in precision agriculture. July 25-28, 2004

DEDICATION

This conference is dedicated to the memory of Pierre Robert (1941-2003), founder and past director of the Precision Agriculture Center at the University of Minnesota, founder of the Journal of Precision Agriculture, and a visionary leader in the origination, development, and dissemination of Precision Agriculture concepts.

PURPOSE

This conference will highlight significant research and its applications in precision agriculture, and showcase emerging technologies and information management for agriculture. It will offer oral and poster presentations and exhibits, as well as an opportunity for discussion and exchange of information in various aspects of precision agriculture. The Precision A to Z Tracks will offer workshops and extended sessions on key topics for producers and agribusiness.

ORGANIZED BY:

The Precision Agriculture Center, College of Agricultural, Food and Environmental Sciences, University of Minnesota, and The Potash and Phosphate Institute

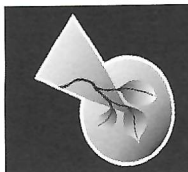
AFFILIATE ORGANIZATIONS:

University of Minnesota:

- College of Agricultural, Food and Environmental Sciences
- Agricultural Experiment Station
- Department of Soil, Water and Climate
- Extension Service

COOPERATING ORGANIZATIONS:

Soil Science Society of America
American Society of Agronomy
Consortium for Site Specific Resource Management
NCR-180



7th International Conference on Precision Agriculture

Table of Contents

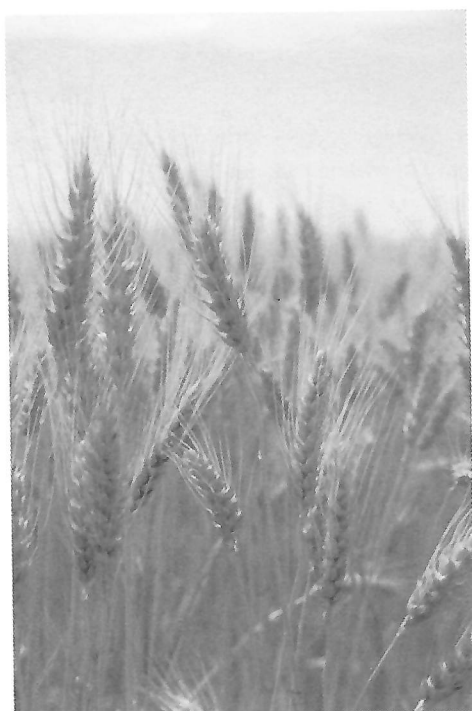
GENERAL

Table of Contents	2
Hyatt Regency Hotel Maps	4
Program Overview	6
Oral Presentations	11
Practitioner A to Z Tracks and Industry Updates.....	28
Poster Sessions.....	36
Exhibitor List	42

Program: SUNDAY, JULY 25

Morning

Workshop on ArcGIS for CCA's	28
Industry Updates.....	28
Concurrent Sessions.....	11
Engineering Technology	11
Natural Resources Variability	11
New Applications Worldwide	12
Profitability	12



Program: MONDAY, JULY 26

Morning

General Session	6
Commemoration to Pierre Robert.....	6
Concurrent Sessions.....	13
Crop Quality.....	13
Engineering Technology	13
Natural Resources Variability	14
Profitability	14
Remote Sensing	15
Practitioner A to Z Tracks.....	29
Technology	29
Nutrient Management Planning	29
Software Tutorials	29

Afternoon

Concurrent Sessions.....	16
Engineering Technology	16
Information Management.....	16
New Applications Worldwide	17
Profitability	17
Remote Sensing	18
Practitioner A to Z Tracks.....	30
GIS Software.....	30
Nutrient Management Planning	30
Growing Higher Yields.....	30
Software Tutorials	31
Poster Session	36
Engineering Technology	36
Information Management.....	36
Natural Resources Variability	36
New Applications Worldwide	36
Precision Management.....	37
Profitability	37
Remote Sensing	37

7th International Conference on Precision Agriculture

Table of Contents



Program: TUESDAY, JULY 27

Morning

Concurrent Sessions..... 19

Education/Outreach.....	19
Environment.....	19
Geostatistics/Sampling.....	20
New Applications Worldwide	20
Precision Management.....	21
Remote Sensing	21

Practitioner A to Z Tracks..... 32

PDA Software	32
Automatic Guidance Systems	32
Yield Monitor Data	32
EC and Soil Test Data	32
Software Tutorials	33

Poster Session 38

Education/Outreach.....	38
Engineering Technology	38
Environment.....	38
Modeling	38
Natural Resources Variability	38
New Applications Worldwide	39
Precision Management.....	39
Remote Sensing	39

Afternoon

Concurrent Sessions..... 22

Engineering Technology	22
Geostatistics/Sampling.....	22
Precision Management.....	23
Profitability	23
Remote Sensing	24

Practitioner A to Z Tracks..... 34

Remote Sensing	34
Precision Agriculture and ISO 9001/14001 Management Systems	34
3-D Image Visualization with GEOWALL	34
Software Tutorials.....	35

Poster Session 40

Crop Quality.....	40
Engineering Technology	40
Geostatistics/Sampling.....	40
Natural Resources Variability	40
New Applications Worldwide	41
Precision Management.....	41
Remote Sensing	41

Program: WEDNESDAY, JULY 28

Morning

Concurrent Sessions..... 25

Engineering Technology	25
Geostatistics/Sampling.....	25
Modeling	26
Precision Management.....	26
Remote Sensing	27

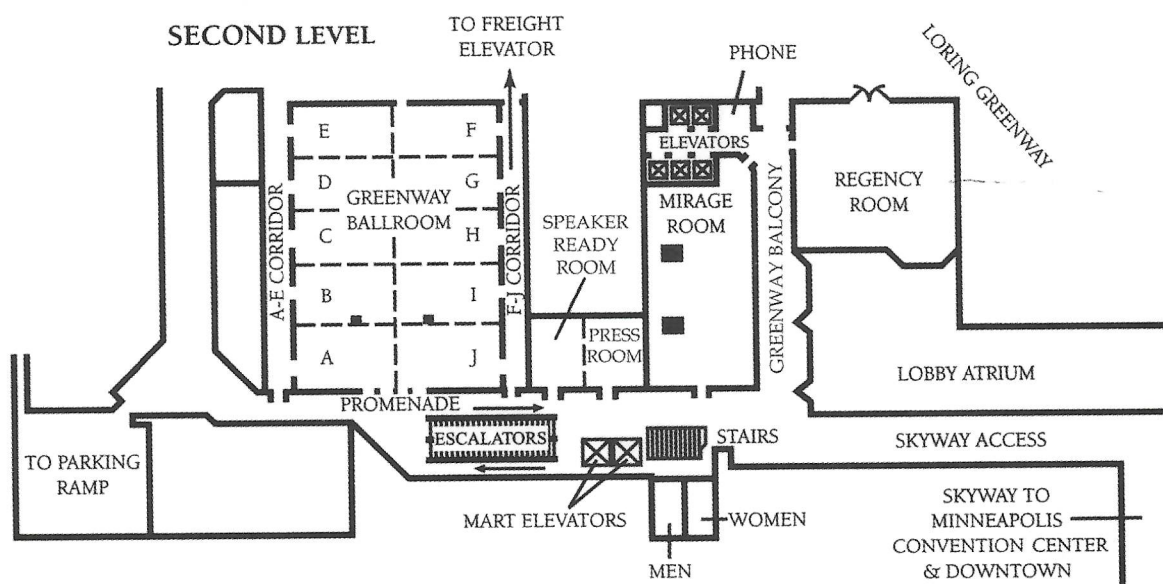
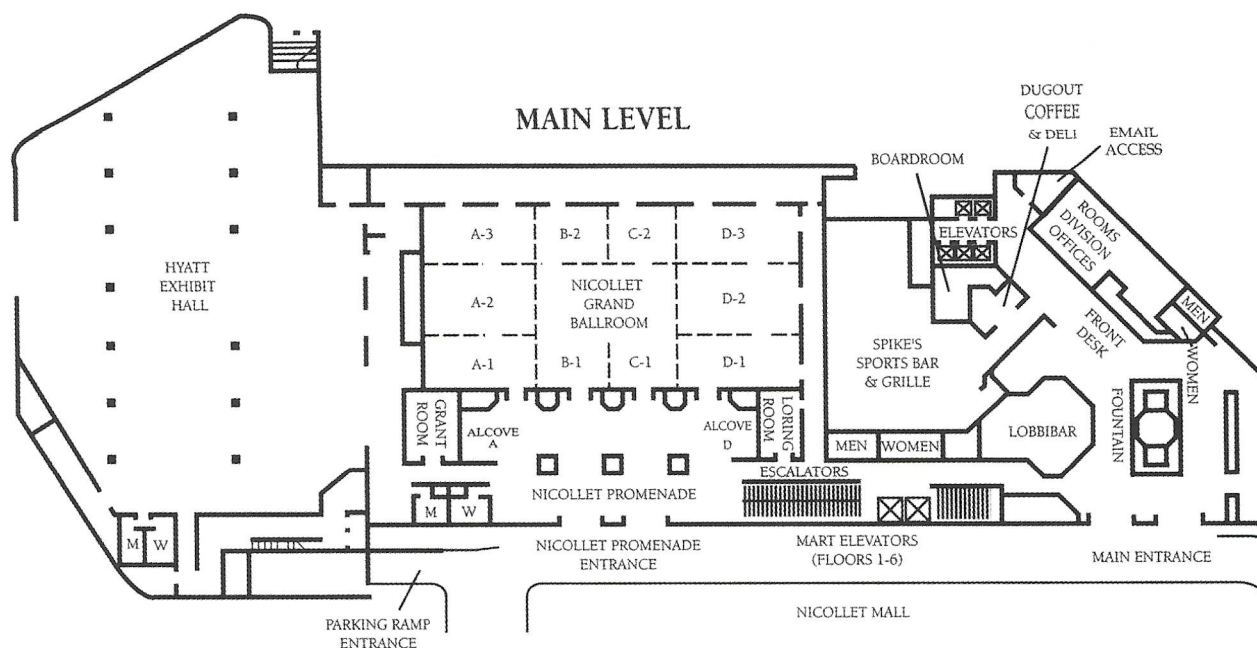
General Session 10





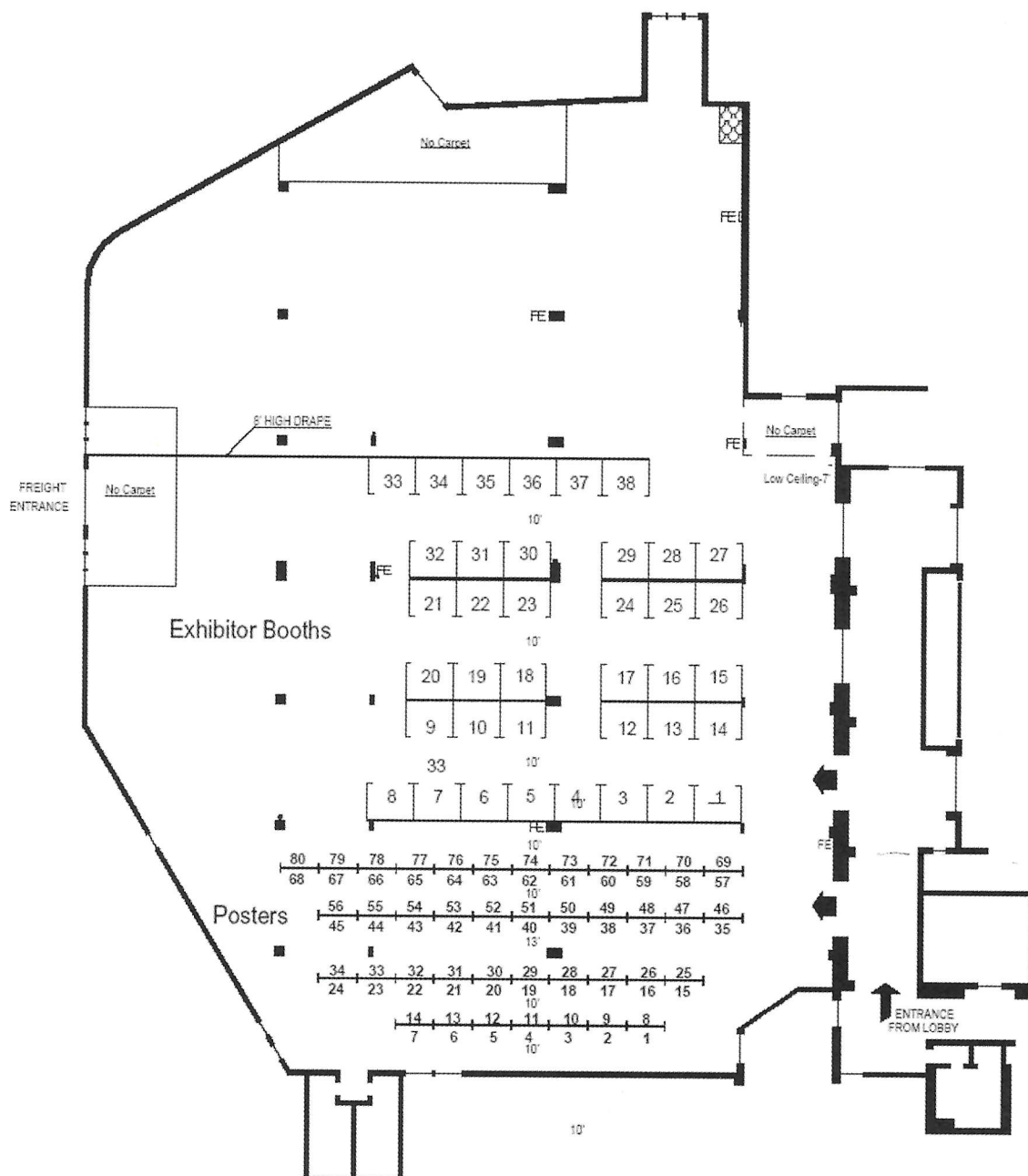
7th International Conference on Precision Agriculture

Hyatt Regency Hotel Maps



7th International Conference on Precision Agriculture

Hyatt Regency Hotel Maps





7th International Conference on Precision Agriculture

Program Overview

SUNDAY, JULY 25

Afternoon

- 11:00-6:00 **Registration**, Nicollet Promenade
- 1:00-5:00 **ArcGIS for Certified Crop Advisors**, Mirage
- 1:10-5:30 **Industry Updates**, Regency
- 1:30-4:10 **Concurrent Sessions**
- Engineering Technology, Greenway B/C
 - Natural Resources Variability, Greenway F/G
 - New Applications Worldwide, Greenway H/I
 - Profitability, Greenway D/E
- 2:30-2:50 **Break**, Greenway Balcony outside Regency
- 5:00-7:00 **Reception and cash bar**, Exhibit Hall
- 5:00-7:00 **Exhibit Opening**, Exhibit Hall



MONDAY, JULY 26

Morning

- 7:00-5:00 **Registration continues**. Nicollet Promenade
- 8:00-8:15 **Opening Remarks:** *David Mulla, Conference Chair, Nicollet Grand Ballroom A/B*
- 8:15-10:00 **General Session:**
- Commemoration to Pierre Robert, Nicollet Grand Ballroom A/B
 - Overview of Pierre Robert's Career. *Gerald Nielsen, Montana State Univ.*
Richard Rust, Univ. Minnesota.
 - Status of Precision Agriculture in the U.S. and World: Industry Perspective. *Marc Vanacht, AG Business Consultants, Clarkson Valley, MO and Dean Fairchild, Cargill Crop Nutrition, Minneapolis, MN.*
 - Status of Precision Agriculture in the U.S.: Academic Perspective. *Peter Nowak, Professor of Sociology, Univ. Wisconsin-Madison.*
 - Status of Precision Agriculture in Europe and the World: Academic Perspective. *John Stafford, Silsoe Solutions, Ampthill, Bedford, United Kingdom.*
 - Research and Education Needs for Precision Agriculture in Most of the World. *Alex McBratney, Australian Centre for Precision Agriculture, Univ. Sydney, Australia and Johan Bouma, Wageningen University.*

7th International Conference on Precision Agriculture

Program Overview



MONDAY, JULY 26

Afternoon

(Monday Morning Continued)

- Farmer Perspective on the Past and Present Status of Precision Agriculture. *Gary Wagner, farmer, Crookston, MN*
- 10:00-10:20 **Break.** Greenway Balcony near Regency
- 10:20-12:00 **Concurrent Sessions**
 - Crop Quality, Greenway H/I
 - Engineering Technology, Greenway D/E
 - Natural Resources Variability, Greenway A
 - Profitability, Greenway F/G
 - Remote Sensing, Greenway B/C
- 10:20-12:00 **Practitioner A to Z Tracks**
 - Track 1-Technology, Regency
 - Track 2-Nutrient Management, Greenway J
 - Track 3-Software Tutorials, Mirage
- 10:00-6:00 **Exhibits**, Exhibit Hall
- 12:00-1:00 **Luncheon**

Note: The Presenter Ready Room is located in the Skyway Suite A. The Press Room is located in Skyway Suite B. Internet access for hotel patrons is located next to the Rooms Division Office on the first floor.

- 1:00-3:00 **Concurrent Sessions**
 - Engineering Technology, Greenway D/E
 - Information Management, Greenway A
 - New Applications Worldwide, Greenway H/I
 - Profitability, Greenway F/G
 - Remote Sensing, Greenway B/C
- 1:00-3:00 **Practitioner A to Z Tracks**
 - Track 1-GIS Software Reviews, Regency
 - Track 2-Nutrient Management Planning, Greenway J
 - Track 3-Software Tutorials, Mirage
- 3:00-3:20 **Break**, Greenway Balcony near Regency
- 3:20-5:00 **Practitioner A to Z Tracks**
 - Track 2-Growing Higher Yields, Greenway J
 - Track 3-Nutrient Management Planner for Minnesota, Mirage
- 3:20-6:00 **Poster Session**, Exhibit Hall, Authors present 4-5 pm
 - Engineering Technology
 - Information Management
 - Natural Resources Variability
 - New Applications Worldwide
 - Precision Management
 - Profitability
 - Remote Sensing
- 5:00-6:00 **Reception**, Exhibit Hall



7th International Conference on Precision Agriculture

Program Overview

TUESDAY, JULY 27

Morning

7:00-5:00 **Registration Continues,**
Nicollet Promenade

8:00-6:00 **Exhibits,** Exhibit Hall

8:00-9:20 **Concurrent Sessions**

- Education/Outreach,
Greenway H/I
- Environment,
Greenway A
- Geostatistics/Sampling,
Greenway D/E
- Precision Management,
Greenway F/G
- Remote Sensing,
Greenway B/C

8:00-9:20 **Practitioner A to Z Tracks**

- Track 1-PDA Software, Regency
- Track 2-Using Yield Monitor
Data, Greenway J
- Track 3-Manure Application
Planner Tutorial, Mirage

9:20-9:40 **Break,** Greenway Balcony near
Regency

9:40-11:00 **Concurrent Sessions**

- Environment,
Greenway A
- Geostatistics/Sampling,
Greenway D/E
- New Applications Worldwide,
Greenway H/I
- Precision Management,
Greenway F/G
- Remote Sensing,
Greenway B/C

9:40-11:00 **Practitioner A to Z Tracks**

- Track 1-Automatic Guidance
Systems, Regency
- Track 2-Using EC and Soil Test
Data, Greenway J (This track
continues until noon)
- Track 3-Cleaning Yield Monitor
Data Software Tutorial, Mirage

11:00-12:00 **Poster Session,** Exhibit Hall,
Authors for AM posters present

- Education/Outreach
- Engineering Technology
- Environment
- Modeling
- Natural Resources Variability
- New Applications Worldwide
- Precision Management
- Remote Sensing

12:00-1:30 **Luncheon,** Nicollet Grand
Ballroom B/C/D

- Research and Education Needs
for Precision Agriculture in the
U.S. *Fran Pierce, Center for
Precision Agricultural Systems,
Washington State University
and John Sadler, USDA-ARS
Cropping Systems and Water
Quality Research Unit, Univ.
Missouri*

*Note: Your name badge is your ticket for
Conference sessions and meals. Please
wear it at all times while attending
Conference events.*

7th International Conference on Precision Agriculture

Program Overview



TUESDAY, JULY 27

Afternoon

1:30-2:30 Concurrent Sessions

- Engineering Technology, Greenway H/I
- Geostatistics/Sampling, Greenway D/E
- Precision Management, Greenway F/G
- Profitability, Greenway A
- Remote Sensing, Greenway B/C

1:30-2:30 Practitioner A to Z Tracks

- Track 1-Remote Sensing I, Regency
- Track 2-ISO 9001 Certification, Greenway J
- Track 3-Identifying Consistently Profitable Areas, Mirage

2:30-2:50 Break, Greenway Balcony near Regency

2:50-3:50 Concurrent Sessions

- Engineering Technology, Greenway H/I
- Geostatistics/Sampling, Greenway D/E
- Precision Management, Greenway F/G
- Profitability, Greenway A
- Remote Sensing, Greenway B/C

2:50-3:50 Practitioner A to Z Tracks

- Track 1-Remote Sensing II, Regency
- Track 2-3-D Image Visualization Tools, Greenway J
- Track 3-Identifying Zones with Yield Monitor Data, Mirage

3:50-6:00 Poster Session, Exhibit Hall, Authors of PM poster present from 4-5 pm

- Crop Quality
- Engineering Technology
- Geostatistics/Sampling
- Natural Resources Variability
- New Applications Worldwide
- Precision Management
- Remote Sensing

5:00-6:00 Reception, Exhibit Hall

6:30-9:00 Dinner Banquet, Nicollet Grand Ballroom B/C/D. Entertainment by Halls of Magic





7th International Conference on Precision Agriculture Program Overview

WEDNESDAY, JULY 28 Morning

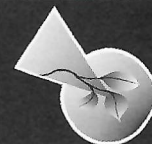
- 7:30 **Registration Continues,**
Nicollet Promenade
- 8:00-10:20 **Concurrent Sessions**
- Engineering Technology,
Greenway B/C
 - Geostatistics/Sampling,
Greenway D/E
 - Modeling, Greenway H/I
 - Precision Management,
Greenway F/G
 - Remote Sensing, Greenway A
- 10:20-10:45 **Break,** Nicollet Promenade
- 10:45-11:15 **General Session,** Nicollet A/B:
What It Will Take to Move
Precision Agriculture Forward
Now
- Al McQuinn, Founder of Ag-
Chem Equipment Co., Inc.
- 11:15-11:30 **Closing Remarks**
- Ed Nater, *Head, Department
of Soil, Water and Climate,
University of Minnesota*
 - Chuck Muscoplat, *Dean,
College of Agriculture, Food
and Environmental Sciences,
University of Minnesota*



Note: To leave messages for conference attendees, please use Poster Board 69 in the Exhibition Hall. The Exhibition Hall is open from Monday morning through Tuesday afternoon, and on Sunday from 5:00-7:00 pm.

7th International Conference on Precision Agriculture

Oral Presentations – Sunday PM



ENGINEERING TECHNOLOGY

Greenway BC

Chair: N. Noguchi, Hokkaido Univ., Japan

- 1:30 A Mobile Fruit Grading Robot System in Orchards
N. Kondo, and S. Shibusawa*
- 1:50 Precision System for Mapping Terrain Trafficability, Tractor-Implement Performance, and Tillage Quality
A. Yahya, M. Zohadie, A. Kheiralla, S.K. Gew, B.S. Wee, E.B. Ng*
- 2:10 3-D Map Generation by a Robot Tractor With a 2-D Laser Range Finder
N. Noguchi, A. Mizushima, and R. Tsubota*

2:30 - Break (Greenway Balcony)

- 2:50 Effect of Soil Drying on Soil Cone Penetration Resistance for Norfolk Sandy Loam Soil
M. Tekeste, R. Raper, and E. Schwab*
- 3:10 Spatial Relationships Between Tillage Implement Draft and Tractor Engine Speed, Ground Speed and Fuel Consumption.
N. McLaughlin, D. Lapen, E. Gregorich, and W. Curnoe*
- 3:30 Design of a Guidance System for Tractors
T. Ye, X. Wang, X. Xue, and Z. Meng*

Note: The Presenter Ready Room is located in the Skyway Suite A.

The Press Room is located in Skyway Suite B. Internet access for hotel patrons is located next to the Rooms Division Office on the first floor.

NATURAL RESOURCES VARIABILITY

Greenway FG

Chair: J. Grove, Univ. Kentucky

- 1:30 Relationship of Near-Surface Moisture Variability to Topographic Variability
A. Kaleita, M. Hirschi, and L. Tian,*
- 1:50 Spatial/Temporal Probabilistic Distribution of Soil Moisture in a Well-drained Paleudalf as Influenced By Landscape
E. Pena-Yewtukhiw, and J. Grove*
- 2:10 Assessing Spatio-Temporal Patterns of Soil Water and Potato Yield for Precision Irrigation Design
*G. Starr**

2:30 - Break (Greenway Balcony)

- 2:50 Yield Variability in an Undulating Field: Classification and Prediction
X. Huang, A. Kravchenko, K. Thelen, N. Martin, and G. Bollero*
- 3:10 Site-specific Relationships Between Corn Population and Yield
K. Sudduth, S. Birrell, D. Bullock, J. Hummel, and N. Kitchen*
- 3:30 Using 2-D and Quasi 3-D Resistivity Surveys to Describe Variability of Surface Horizon Depth
M. du Saire and J. Baker*
- 3:50 Corn Grain Yield in Rolling Landscapes: Terrain Attributes or Surface Soil Properties?
J. Grove, E. Pena-Yewtukhiw, and J. Thompson*



7th International Conference on Precision Agriculture

Oral Presentations – Sunday PM

NEW APPLICATIONS WORLDWIDE Greenway HI

Chair: M. Wong, CSIRO, Australia

- 1:30 Research and Practice of GPS Applications
At the China National Demonstration
Farm for Precision Agriculture
M. Zhijun, W. Xiu, X. Xuzhang, and Y. Tao*
- 1:50 Precision Farming Applications in Small
Cotton Fields of Thessaly, Greece
A. Markinos, T. Gemtos, T. Nassiou, L.
Toulios, D. Pateras, and G. Zerva*
- 2:10 Gender Roles in Precision Irrigation in
West Nepal: A Study of Economics of Drip
Technology
B. Upadhyay and K. Bhattarai*

2:30 - Break (Greenway Balcony)

- 2:50 Precision Agriculture for All
*M. Wong**
- 3:10 Modeling Precision Agriculture Maps
With Wireless Sensor Networks
A. Camilli, and C. Cugnasca*
- 3:30 Discovering Pesticide Application
Practices Using Data Mining
*A. Abdullah**

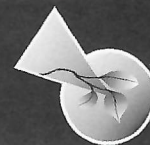
PROFITABILITY Greenway DE

Chair: R. Roberts, Univ. Tennessee

- 1:30 The Potential of Precision Agriculture in a
Developing Country: Cotton in Benin
J.M. Gandonou, and C. Dillon*
- 1:50 Yield Response Functions to N, P, and
Plant Populations Under Variable Rate and
Standard Applications in the Bothaville
District, South Africa
N. Matela, W. Nell, and Z. Alemu*
- 2:10 Cost:Benefit of Variable Rate Fertilization
for a Farm in Southern Brazil: A Case
Study.
G. Roloff, and D. Focht*

2:30- Break (Greenway Balcony)

7th International Conference on Precision Agriculture
Oral Presentations – Monday AM



CROP QUALITY
Greenway HI

25

Chair: G. Malzer, Univ. Minnesota

- 10:20 By-Plant Precision Sensing for Variable Nitrogen Rate Application in Corn
R. Teal, B. Raun, J. Solie, M. Stone, K. Freeman, G. Johnson, and K. Martin*
- 10:40 Decision Support System for Improving Wheat Quality in Semi-arid Regions
D. Bonfil, I. Mufradi, and S. Asido*
- 11:00 Spatial Variation in Economic Optimum Nitrogen Rate for Corn Yield and Quality in South-Central Minnesota
R. Roggenbuck, D. Mulla, P. Robert, and G. Malzer*
- 11:20 On-Combine Sensing of Grain Protein Concentration
D. Long, R. Engel, and F. Carpenter*
- 11:40 Spatial and Temporal Variability in Corn Yield and Quality Responses to N Fertilization Within an Eastern Illinois No-till Field
Y. Miao, D. Mulla, and P. Robert*

12:00 - Lunch (Nicollet CD)

ENGINEERING TECHNOLOGY
Greenway DE

48

Chair: T. Colvin, USDA-ARS, National Soil Tilth Lab

- 10:20 Anatomy of the 15th Anniversary Soil Doctor System
*S. Colburn and J. Colburn Jr.**
- 10:40 Development of an On-the-Go Soil Sensing System for Determinations of Soil Ph and Lime Requirement
R. Viscarra Rossel, L. Thylén, A. McBratney, and M. Gilbertsson*
- 11:00 Analysis of Soil FTIR/ATR Spectral Data Using Wavelet Analysis to Determine Soil Nitrate Content
B. Jahn, S. Upadhyaya, D. Verbovy, and P. Brooksby*
- 11:20 Sensing Macronutrients in Soil Extracts Using Ion-selective Membranes
H. Kim, J. Hummel, and S. Birrell*
- 11:40 Managing Ph Variability With On-the-Go Ph Mapping
E. Lund, K. Collings, P. E. Drummond, C. Christy, and V. Adamchuk*

12:00 - Lunch (Nicollet CD)



7th International Conference on Precision Agriculture

Oral Presentations – Monday AM

NATURAL RESOURCES VARIABILITY

Greenway A

Chair: S. Pocknee, Univ. Georgia

40

- 10:20 The Use of Electromagnetic Induction in Delineating Nitrogen Management Zones
L. Cockx, M. Van Meirvenne, and G. Hofman*
- 10:40 Principal Landscape Determinant of Spatially Variable Crop Yield in Western Australia
M. Wong, S. Asseng, K. Wittwer, and G. Lyle*
- 11:00 Application of Geostatistics in the Prediction of Yield Maps for Tea
*A. Anandacoomaraswamy**

12:00 - Lunch (Nicollet CD)

SP. Sample 2

Need Better Signs
Helps to have Tracks
Profit decision zones

PROFITABILITY

Greenway FG

Chair: D. Lambert, Purdue Univ.

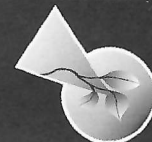
- 10:20 Marginal Impact of Education, Financial Performance and Government Programs on the Adoption of Precision Agriculture Technology
M. Friedrichsen, W. Nganje, W. Wilson, C. Gustafson, and D. Franzen*
- 10:40 Site-Specific Profitability, Methods, Analysis, and Decisions
D. Myers, N. Kitchen, K. Sudduth, R. Massey, and S. Drummond*
- 11:00 Evaluating the Returns to Site-specific Irrigation
*C. Oliveira, R. Yoder, and J. Larson**
- 11:20 Economic Comparison of Subsurface Drip Irrigation Practices
*J. Salim, C. Dillon, and M. Kanakasabai**

65

34

12:00 - Lunch (Nicollet CD)

7th International Conference on Precision Agriculture
Oral Presentations – Monday AM



REMOTE SENSING
Greenway BC

Chair: D. Wang, Univ. Minnesota

47

- 10:20 Field Survey System Using an Unmanned Helicopter and Simplification of Topographic Dataset
*R. Sugiura, K. Ishii, and N. Noguchi**
- 10:40 Detecting Leaf Features for Automatic Weed Control Using Trinocular Stereo Vision
M. Nielsen, H. Andersen, D. Slaughter, and D. Giles*
- 11:00 Radiometric Calibration of QuickBird Multispectral Imagery Data
J. Wu, D. Wang, and P. Robert*
- 11:20 Integrating Synthetic Aperture Radar With Optical Information for Crop Management Applications
G. Holmes, J. Bodley, P. Meadows, and H. Poilve*
- 11:40 Development of an Automated System to Geo-rectify Images and Allow Quick Transformation Into a Prescription Map
R. Price, and A. Pavan*

12:00 - Lunch (Nicollet CD)





7th International Conference on Precision Agriculture

Oral Presentations – Monday PM

ENGINEERING TECHNOLOGY

Greenway DE

Chair: L. Thylen, Swedish Inst. Agric.

- 1:00 Plant Canopy Sensor With Modulated Polychromatic Light Source
K. Holland, J. Schepers, J. Shanahan, and G. Horst*
- 1:20 Soil Monitoring Using Anion Exchange Membranes and Mid-IR Spectroscopy
R. Linker, A. Shaviv, and I. Shmulevich*
- 1:40 Systems for Site-Specific On-the-Go Control of Nitrogen Top-Dressing During Spreading
H. Heege, S. Reusch, and E. Thiessen*
- 2:00 Post Processing Correction to Improve the Accuracy of Yield Monitor Data in Grain Crops
S. Shearer, J. Fulton, and M. Veal*
- 2:20 Automated Pollen Collection
J. Bernardo, A. Hirakawa, and C. Cugnasca*
- 2:40 Crop-Meter for Site Specific Farming
D. Ehlert, K.H. Pammer, and R. Adamek*

3:00 - Break (Greenway Balcony)

INFORMATION MANAGEMENT

Greenway A

Chair: G. Davis, NCRS, Columbia, MO

- 1:20 Analysis of Errors Affecting Yield Map Accuracy
S. Drummond and K. Sudduth*
- 1:40 Agroffice: WinGIS Based Applications for Precision Farming
*W. Mayer** *progis.com*
- 2:00 Track Your Food
*G. Duerrstein**

★ send biz to ESTC

37
7th International Conference on Precision Agriculture
Oral Presentations – Monday PM



NEW APPLICATIONS WORLDWIDE
Greenway H1

Chair: S. Cook, CIAT, Columbia



- 1:00 Resource Management By Farmers for
Indigenous Plant Protection in Agriculture:
Strategies
V. Savaliya and P. Kanani*
- 1:20 Adapting Site Specific Nutrient
Management to Small Farms of the
Tropics
T. Attanandana, R. Yost, and P.
Veerapattananirund*
- 1:40 A Bayesian Modeling Approach to
Site Suitability Under Conditions of
Uncertainty
R. O'Brien, S. Cook, R. Corner, and M. Peters*
- 2:00 Using Site-specific Information to
Encourage Safe and Essential Agricultural
Development
S. Cook, T. Oberthur, R. O'Brien, and D.
White*
- 2:20 Yield Mapping From Manually Harvested
Sugar Cane in Brazil
J. Molin, L. Menegatti, and C. Manzzoni*

3:00 - Break (Greenway Balcony)

PROFITABILITY
Greenway FG

Chair: D. Westfall, Colorado State Univ.

- 1:00 The Impact of Farmer Risk Preference
on Optimal Nutrient Management Zone
Delineation
C. Dillon, J. Salim, and M. Kanakasabai*
- 1:20 Development and Use of Risk Maps in
Precision Agriculture
L. Powers, C. Dillon, S. Isaacs, and S.
Saghaian*
- 1:40 A Confidence Interval for the Optimal
Nitrogen Fertilization
M. Bachmaier, and M. Gandorfer*
- 2:00 Increased Gross Return From Site-specific
Water Management for Potatoes Under
Center Pivot Irrigation
B. King, J. Stark, and R. Wall*
- 2:20 Assessment of Soil Mapping Value: Part
II. Potential Profitability
V. Adamchuk, C. Wang, D. Marx, R. Perrin,
and A. Dobermann*

3:00 - Break (Greenway Balcony)

32



7th International Conference on Precision Agriculture Oral Presentations – Monday PM

REMOTE SENSING Greenway BC

Chair: H. Lilienthal, Fed. Ag. Res. Center, Germany

Handwritten signature and number 57



- 1:00 Equifertiles – The Key to Extend the Supervised Areas of Ground Based Remote Sensing Systems
H. Lilienthal, and E. Schug*
- 1:20 Advanced Concept for Research on Variable Rate Nitrogen Application Based on Remote Sensing
S. Reusch, J. Jasper, and A. Link*
- 1:40 Detection of Stable Soil Temporal Field Patterns by a Geostatistical Method Based on Remote Sensing Data: Application in Precision Agriculture
S.I. Touriño-Soto, M. Gay, and J.P. Denux*
- 2:00 Mapping of Leaf Water Potential Using Thermal Images for Site-specific Irrigation
Y. Cohen, V. Alchanatis, M. Meron, and Y. Saranga*
- 2:20 Using Thermal Imagery to Identify Crop Water Stress and Nitrogen Requirements in Corn
R. Heiniger, and R. Sripada*
- 2:40 Near-Field Reflectance and Fluorescence Measurements for Nutrient Deficiencies Detection in Potato (*solanum tuberosum*, L.)
M. Belanger, A. Viau, G. Samson, and M. Chamberland*

3:00 - Break (Greenway Balcony)

7th International Conference on Precision Agriculture

Oral Presentations – Tuesday AM



EDUCATION/OUTREACH

Greenway HI

Chair: K. Shannon, Univ. Missouri

- 8:00 Training: An Effective Medium for Increasing Knowledge and Adoption of Agricultural Technology
V. Savaliya, P. Kanani, and B. Savliya*
- 8:20 Tools for Training Precision Agriculturalists
D. Hancock, T. Stombaugh, and B. Kootstra*
- 8:40 Precision Farming in Kentucky: Evaluating Public and Private Sector Influences on the Adoption Decision
*R. Grusy**
- 9:00 Exploring Agriculture Relationships in 3D
C. Sommers-Austin, R. Araujo, D. Starkey, V. Shelhamer, D. Long, and M. O'Neill*

9:20 - Break (Greenway Balcony)

ENVIRONMENT

Greenway A

Chair: C. Crozier, North Carolina State Univ.

- 8:20 Estimating Yield and Environmental Risks Associated With Variable Rate Nitrogen Management for Corn Using Apollo
K. Thorp, B. Batchelor, J. Paz, and B. Steward*
- 8:40 Remote Sensing for Precision N Management in a Corn-Wheat-Soybean Rotation
N. Hong, C. Crozier, J. White, R. Weisz, R. Heiniger, and R. Sripada*
- 9:00 Precision Conservation for Reduction of Nitrate Leaching in Irrigated Corn
J. Delgado, W. Bausch, R. Follett, R. Khosla, K. Mauch, D. Westfall, M. Dillon, K. Barbarick, S. Essah, A. Stuebe, and R. Sparks*

9:20 - Break (Greenway Balcony)

- 9:40 Estimating Spatial Erosion Variability in Topographically Complex Landscapes.
C. Bonilla, J. Norman, and C. Molling*
- 10:00 Spatial Variability in Carbon Dioxide Loss After Moldboard Plowing Within a Soil Map Unit
D. Reicosky, D. Archer, and C. Wente*
- 10:20 Determining P Concentration Using Spectral Reflectance of Grass Samples in the Lake Okeechobee Basins in UV, VIS, and NIR Regions
I. Bogrecki and W. Lee*
- 10:40 Assessing Reclamation Features on Abandoned, Inactive, and Permitted Coal Mines: Using Tablet Computers and Integrated GPS
W. Joseph, L. Meier, and K. Garnett*

11:00 - Poster Session (Exhibition Hall)

12:00 - Lunch (Nicollet CD)



7th International Conference on Precision Agriculture Oral Presentations – Tuesday AM

GEOSTATISTICS/SAMPLING Greenway DE

Chair: D. Franzen, North Dakota State Univ.

- 8:20 Strategies From Point to Spatial Information to Determine the Soil Continuum in Precision Agriculture (PA)
R. Herbst and J. Lamp*
- 8:40 Using Clustering and CART to Characterize Field Spatiotemporal Dynamics
R. Plant and A. Roel*
- 9:00 Delineation of Nitrogen Management Zones
D. Franzen and T. Nanna*

9:20 - Break (Greenway Balcony)

- 9:40 The Impact of Soil Sampling Errors on Variable Rate Fertilization
R. Hoskinson, R. Rope, L. Blackwood, R. Lee, and R. Fink*
- 10:00 Grape Phenolics and Wine Quality: Measuring Spatial Variability in a Commercial Vineyard Using Precision Agriculture Tools.
J. Cortell, J. Kennedy, J. Baham, A. Connelly, A. Gallagher, M. Halbleib, J. Pinkerton, T. Righetti, R. Schreiner, and B. Watson*
- 10:20 Site-Specific Yield Prediction for Varying Nitrogen Rates By the Application of Data Mining Techniques
G. Weigert and P. Wagner*

11:00 - Poster Session (Exhibition Hall)

12:00 - Lunch (Nicollet CD)

NEW APPLICATIONS WORLDWIDE Greenway HI

Chair: R. Yost, Univ. Hawaii

- 9:40 Sugar Cane Precision Agriculture in Brazil
D. Cerri and P. Magalhães*
- 10:00 Potential of Precision Agriculture for Small- and Medium-sized Coffee Farms in Central America
P. Laderach, J. Bell, A. Helfenberger, and K. Budmiger*
- 10:20 Development of Site-specific Nutritional Standards for Table Grape Using Precision Agriculture Tools in Chile
R. Ortega and A. Esser*

11:00 - Poster Session (Exhibition Hall)

12:00 - Lunch (Nicollet CD)

7th International Conference on Precision Agriculture

Oral Presentations – Tuesday AM



PRECISION MANAGEMENT

Greenway FG

Chair: R. Ferguson, Univ. Nebraska, Lincoln

- 8:20 Gamma Ray Spectrometry Used to Spatially Predict Soil Properties Important to Plant Growth
G. Pracilio, M. Adams, and K. Smettem*
- 8:40 Developing Recommendations for Site-specific Nitrogen Management of Irrigated Maize
R. Ferguson, A. Dobermann, C. Shapiro, D. Walters, C. Wortmann, D. Tarkalson, and D. Baltensperger*
- 9:00 Using Variable Rate Technology (VRT) and Yield Mapping for Optimizing Fertilizer Recommendations for Corn and Soybeans
S. Ebelhar, C. Hart, E. Varsa, K. Robertson, T. Wyciskalla, J. Hamson*

9:20 - Break (Greenway Balcony)

- 9:40 Spatially Variable Yield Levels Don't Predict Spatially Variable N Need
P. Scharf, N. Kitchen, K. Sudduth, and J. Davis*
- 10:00 Swedish Farmers' Experiences of the Yara N-Sensor 1998-2003
M. Söderström, K. Nissen, K. Gustafsson, T. Börjesson, A. Jonsson, and L. Wijkmark*
- 10:20 Experiences of a Three-Year Site-specific Farming Trial Especially Regarding Nutrient Replacement and Soil Draft Measurement
P. Mesterházi, P. Csathó, T. Árendás, and M. Neményi*
- 10:40 Implementation and Validation of Sensor-Based Site-Specific Crop Management Through On-Farm Research
K. Shannon, H. Palm, N. Kitchen, and K. Sudduth*

11:00 - Poster Session (Exhibition Hall)

12:00 - Lunch (Nicollet CD)

REMOTE SENSING

Greenway BC

Chair: J. Lamb, Univ. Minnesota

- 8:20 Farmstar: A Fully Operational Remote Sensing Service for Precision Agriculture
*B. Coquil**
- 8:40 Detection of the Sugar Beet Disease Rhizoctonia Solani By Using Hyperspectral Remote Sensing Data
R. Laudien, P. Doluschitz, and G. Bareth*
- 9:00 Development of Crop Quality Models From Landsat Image Data in Sugarbeets
*D. Humburg**

9:20 - Break (Greenway Balcony)

- 9:40 Spatial, Spectral and Temporal Resolution: Evaluating Various Types of Imagery for Site-specific Weed Management
F. Dougher, L. Rew, and R. Lawrence*
- 10:00 Weed Classification Based on Spectral Properties
C. Gee, L. Bonvarlet, J. Magnin-Robert, and J. Guillemin*
- 10:20 Applications of Remote Sensing in Pest Scouting: Evaluating Options and Exploring Possibilities
A. Abdullah and M. Umer*

11:00 - Poster Session (Exhibition Hall)

12:00 - Lunch (Nicollet CD)



7th International Conference on Precision Agriculture **Oral Presentations – Tuesday PM**

ENGINEERING TECHNOLOGY

Greenway HI

Chair: F. Pierce, Washington State Univ.

- 1:30 Utilizing Controller Area Network Based Systems for Data Collection
T. Stombaugh, M. Darr, S. Shearer, and M. Montross*
- 1:50 Study on Implementation Viability of ISO 11783 Terminal Virtual and Task Controller Using Handheld Devices
D. Landi C. Cugnasca, and A. Camilli*
- 2:10 Wireless Local Area Network Technology for On-farm Monitoring and Control
S. Pocknee, V. Garrick, and C. Kvien*

2:30 - Break (Greenway Balcony)

- 2:50 Wireless Networks for Real-time Temperature Monitoring and Control for Frost Protection
F. Pierce, E. Perry, T. Elliott, and G. Matthews*
- 3:10 An Optical Sensor for On-the-Go Soil Constituent Sensing
*C. Christy**
- 3:30 Field Evaluation of a Portable, Data Logging Soil Moisture Probe
*D. Kieffer, and M. Thurow**

3:50 - Poster Session (Exhibition Hall)

GEOSTATISTICS/SAMPLING

Greenway DE

Chair: A. McBratney, Univ. Sydney, Australia

- 1:30 Assessing Non-Stationary Variability in Durum Wheat Yield Using Random Functions of Order K
A. Castrignano, B. Basso, and M. Tomaiuolo*
- 1:50 Improving Sampling Strategies By Improved Cognition
D. Dörschlag, M. Backes, and L. Plümer*
- 2:10 Covariance Model Selection in Spatial Analysis of Yield-Monitor Data in Randomized Complete Blocks
N. Hong, J. White, M. Gumpertz, and R. Weisz*

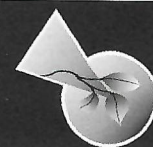
2:30 - Break (Greenway Balcony)

- 2:50 Landscape Scale Agricultural Experimentation: Spatial Autocorrelation and Potato Yield
R. Shillito, D. Timlin, D. Fleisher, V.R. Reddy, and B. Quebedeaux*
- 3:10 Testing Appropriate On-Farm Trial Designs and Statistical Methods for Precision Farming: A Simulation Approach
T. Griffin, D. Lambert, and J. Lowenberg-DeBoer*

3:50 - Poster Session (Exhibition Hall)

7th International Conference on Precision Agriculture

Oral Presentations – Tuesday PM



PRECISION MANAGEMENT

Greenway FG

Chair: V. Adamchuk, Univ. Nebraska-Lincoln

- 1:30 Determining Productivity Potential of Site-specific Management Zones for Optimum N Management
R. Khosla, D. Inman, and D. Westfall*
- 1:50 Areal Association of Production Level Management Zone Delineation and Yield Classes
W. Gangloff, D. Westfall, R. Khosla, and R. Reich*
- 2:10 Simplifying Management Zones: A Pragmatic Approach to the Development and Interpretation of Management Zones in Australia
M. Adams and I. Maling*

2:30 - Break (Greenway Balcony)

- 2:50 First Economical Results in Precision Agriculture Combining Resistivity, Satellite Data, and Field Observations Over 1500 Hectares
M. Dabas, D. Rouiller, J. Larcher, and M. Chalat*
- 3:10 Summarizing Field Variability With Management Zones
E. Vrindts, A. Mouazen, M. Reyniers, K. Maertens, M. Maleki, H. Ramon, and J. De Baerdemaeker*

3:50 - Poster Session (Exhibition Hall)

PROFITABILITY

Greenway A

Chair: C. Dillon, Univ. Kentucky

- 1:30 Effects of Farm and Farmer Characteristics on the Timing of Precision Soil Sampling Technology Adoption
R. Roberts, B. English, J. Larson, R. Cochran, S. Larkin, M. Marra, S. Martin, and J. Reeves*
- 1:50 Incorporating Soil Test Information Into Variable Rate Manure Management Recommendations: a Systems Approach
D. Lambert, J. Lowenberg-DeBoer, and G. Malzer*
- 2:10 The Value of Soil Electrical Conductivity and Topographical Information for Variable Rate Nitrogen Application
A. Spaulding, S. Saghaian, C. Dillon, T. Mueller, and S. Shearer*

2:30 - Break (Greenway Balcony)

- 2:50 Variable Seeding and Nitrogen Rates on Rolling Kentucky Terrains: Effects on Corn Yield
R. Barnhisel, A. Moberly, and T. Mueller*
- 3:10 Using Breakeven Analysis to Determine Precision Weed Control Technology
J. Larson, R. Roberts, R. Cochran, and J. Wilkerson*
- 3:30 An Economic Analysis of a Spatial Statistics Approach to Management Zone Delineation in Precision Agriculture: The Case of Texas Cotton
*M. Velandia, R. Rejesus, E. Segarra, K. Bronson, and R. Kulkarni**

3:50 - Poster Session (Exhibition Hall)



7th International Conference on Precision Agriculture Oral Presentations – Tuesday PM

REMOTE SENSING

Greenway BC

Chair: D. Long, USDA-ARS, Pendleton, OR

- 1:30 Application of Hyperspectral Imagery in Winter Wheat Nutrition Diagnosis
*W. Huang**
- 1:50 In-line Quality Measurements on Forage Maize
K. Maertens, J. De Baerdemaeker, and P. Reyns*
- 2:10 The Effect of Diurnal Variations of Canopy Reflectance on the Assessment of Biomass Formation in Wheat
E. Stickel, G. Huber, J. Liebeler, J. Schaechl, and F. Mädl*

2:30 - Break (Greenway Balcony)

- 2:50 Validation of Field Scale Spectral Measurements of the Nitrogen Status in Wheat
B. Mistele, R. Gutser, and U. Schmidhalter*
- 3:10 Potentials and Limits of Remote Sensing Data for Detection of Wheat Fusarium Head Blight on Hard Red Spring Wheat in Minnesota
S. Laguet, C. Hollingsworth, C. Motteberg, and I. McRae*
- 3:30 Time Series Analysis of High Spatial Resolution Spot Images for Wheat Growth Monitoring
J. Denux, M. López, and F. Jacob*

3:50 - Poster Session (Exhibition Hall)



7th International Conference on Precision Agriculture
Oral Presentations – Wednesday AM



ENGINEERING TECHNOLOGY

Greenway BC

Chair: M. Dabas, Geocarta, France

- 9:20 On-Line NIR Spectroscopic Measurement of Soil Moisture Content for Real-time Measurement System of Soil Compaction
A. Mouazen, J. De Baerdemaeker, and H. Ramon*
- 9:40 A Comparison of Different Sensors for Soil Mapping: The ATB Case Study
M. Dabas, H. Domsch, and E. Lueck*
- 10:00 Estimating Weed Mass Within a Wheat Crop Using Total Green Cover Measurements
R. Baron, T. Crowe, and T. Wolf*

10:20 - Break (Nicollet Promenade)

10:45 - General Session (Nicollet AB)

GEOSTATISTICS/SAMPLING

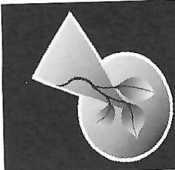
Greenway DE

Chair: D. Clay, South Dakota State Univ.

- 8:20 Spatial Variability in Some Properties of Paddy Soils Under Different Fertilizer Management
A. Eneji and S. Inanaga*
- 8:40 Evaluation of Zoning Methods for Precision Viticulture in Chile
R. Ortega and A. Esser*
- 9:00 Analyzing Spatial and Temporal Variability of Soil Moisture Content
S. Vieira, C. Grego, G. Topp, and W. Zebchuk*
- 9:20 Spatial Analysis in Precision Targeting for Monitoring and Control of Pear Psylla
Y. Cohen, A. Hezroni, D. Nestel, and V. Soroker*
- 9:40 Mapping Soil Properties Using a Multi-Scale Spatial Model
C. Morgan, J. Zhu, J. Norman, and F. Wayne*
- 10:00 Utilizing Fine-Scale Secondary Information for Improving Maps of Soil Attributes
J. Ping and A. Dobermann*

10:20 - Break (Nicollet Promenade)

10:45 - General Session (Nicollet AB)



7th International Conference on Precision Agriculture

Oral Presentations – Wednesday AM

MODELING

Greenway H1

Chair: J. Paz, Iowa State Univ.

- 9:00 Simulation Modeling of Nitrogen Balance for Potato At Early Growth Stage
H. Li, L. Parent, and A. Karam*
- 9:20 Measuring Crop Response to Subsurface Drainage With Remote Sensing
J. Boler, G. Sands, and L. Busman*
- 9:40 Modeling Yield By Neural Network
K. Diker, D. Heermann, G. Buchleiter, W. Bauschy, H. Farahani, and D. Westfall*
- 10:00 Development and Evaluation of a Decision Support System for Precision Agriculture
W. Batchelor, J. Paz, and K. Thorp*

10:20 - Break (Nicollet Promenade)

10:45 - General Session (Nicollet AB)

PRECISION MANAGEMENT

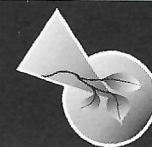
Greenway FG

Chair: R. Plant, Univ. California, Davis

- 9:00 Potential Effectiveness of Precision Weed Control in North-Eastern Italy
F. Morari, A. Berti, M. Borin, and I. Sartorato*
- 9:20 Integrated Pest Management Using Precision Herbicide Application
D. A. Claypool, S. Miller, L. Held, and L. Munn*
- 9:40 Site-Specific Management of Green Peach Aphid, *Myzus persicae* (Sulzer), in Seed Potato
M. Carroll, E. Radcliffe, I. MacRae, K. Olson, and D. Ragsdale*
- 10:00 A Field-Implementable Site-Specific Variable Rate Fertilizer Nitrogen Application Program for Cotton
*S. Grellet, B. Taylor, B. Roberts, R. DeMoura, K. Klonsky, and R. Plant**

10:20 - Break (Nicollet Promenade)

10:45 - General Session (Nicollet AB)



REMOTE SENSING

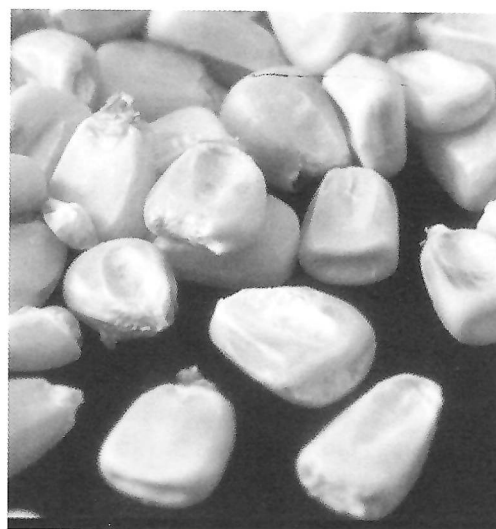
Greenway A

Chair: G. Peterson, Pennsylvania State Univ.

- 8:00 Temporal and Spatial Relationships
Between Cotton Yield and High-Spatial
Hyperspectral Remote Sensing Imagery
*P. Zarco-Tejada, S. Ustin, and M. Whiting**
- 8:20 Spatial Variation of Yield and Reflectance
Patterns in Corn Fields Induced by Soil
and Nitrogen Management
J. Hatfield, G. Hart, B. Engelhardt, W.
Oesterreich, A. Swalla, and G. Hart*
- 8:40 Assessing Grain Sorghum Growth and
Yield Patterns Using Quickbird Satellite
Imagery
C. Yang, J. Everitt, and J. Bradford*
- 9:00 "Pastures From Space" – Quantitative
Estimation of Pasture Biomass and Growth
Rate Using Satellite Remote Sensing
D. Henry, A. Edirisinghe, G. Donald, and G.
Mata*
- 9:20 Non-Destructive Assessment of DM Yield,
Nutrient Content and Feeding Value of
Grass Swards With Imaging Spectroscopy
T. Schut, M. Hendriks, F. van Evert, L.
Hoving, M. Stienezen, G. Holshof, G. Molema,
and J. Meuleman*
- 9:40 Estimating Rice Growth Using Spectral
Indices From Narrow Bands and
Simulated Broad Bands and Satellite Data
C. Yang and R. Chen*
- 10:00 Using Landsat 7 ETM+ Data to Estimate
LAI and Response to Silvicultural
Treatments in Loblolly Pine
F. Flores and L. Allen*

10:20 - Break (Nicollet Promenade)

10:45 - General Session (Nicollet AB)





7th International Conference on Precision Agriculture **Practitioner A-Z Track**

SUNDAY, JULY 25
Afternoon

1:00-5:00 **ArcGIS for Certified Crop Advisors**, Mirage room.
Quentin Rund, PAQ Interactive

1:10-5:50 **Industry Updates**, Regency

1:10 ----- Digital Globe – John Ahlrichs

1:30 ----- Ag Leader – Mike Olson

1:50 ----- OmniStar – John Pointon

2:10 ----- Midwest Technologies – Dugan Peterson

2:30 ----- Break (in Greenway corridor)

2:50 ----- EADS Astrium – Bernard Coquil

3:10 ----- John Deere – Than Hartsock and Tom McMurren

3:30 ----- NTech – Ted Mayfield

3:50 ----- Spectrum Technologies – Mike Thurow

4:10 ----- SST – David Waits

4:30 ----- Agri ImaGIS - Lanny Faleide

4:50 ----- Vega Venture - Don Brown

5:10 ----- SATCON – Georg Duerstein

5:30 ----- Trimble – Dr. Rozalind Buick

The A to Z Tracks present the latest advances in precision agriculture and include interactive sessions that showcase emerging technologies and information management strategies for production agriculture. Although intended for growers and the agribusiness community (i.e. practitioners), the A to Z Tracks are open to all participants at the Conference. Attendance at Tracks 2 and 3 and the Sunday workshop earns continuing education units (CEUs).



7th International Conference on Precision Agriculture

Practitioner A-Z Track



MONDAY, JULY 26

Morning Sessions

8:00-10:00 **General Session**, Nicollet
Grand Ballroom A/B

10:00-10:20 **Break** (Greenway Balcony)

10:20-12:00 **Track 1- Technology, Regency**

10:20 ---- PDA/GPS Hardware Review, P.
Rasmussen, Utah State Univ.

10:40 ---- PDA/GPS Hardware Review, P.
Rasmussen, Utah State Univ.

11:00 ---- PDA/GPS Hardware Review, P.
Rasmussen, Utah State Univ.

11:20 ---- PDA/GPS Hardware Review, P.
Rasmussen, Utah State Univ.

11:40 ---- PDA/GPS Hardware Review, P.
Rasmussen, Utah State Univ.

12:00-1:00 **Lunch**, Nicollet Grand
Ballroom B/C/D

10:20-12:00 **Track 2 – Opportunities in Nutrient Management Planning**, Greenway J.

*Moderator: Scott Murrell,
Potash and Phosphate Institute*

10:20 ---- Nutrient Management Planning:
Latest Developments, J.
Lemunyon, USDA-NRCS

10:40 ---- Nutrient Management Planning
in Minnesota, J. St. Ores, USDA-
NRCS Minnesota

11:00 ---- Multi-Level Management
Approaches, C. Lander, USDA-
NRCS

11:20 ---- Experiences in Nutrient
Management Planning, R.
Wildman, Agricultural Consulting
Services

11:40 ---- Discussion

12:00-1:00 **Lunch**, Nicollet Grand
Ballroom B/C/D

10:20-12:00 **Track 3 – Hands on Software Tutorials**, Mirage

10:20 ---- Field Enterprise Analysis, G.
Carlson, South Dakota State Univ.

10:40 ---- Field Enterprise Analysis, G.
Carlson, South Dakota State Univ.

11:00 ---- Field Enterprise Analysis, G.
Carlson, South Dakota State Univ.

11:20 ---- Field Enterprise Analysis, G.
Carlson, South Dakota State Univ.

11:40 ---- Field Enterprise Analysis, G.
Carlson, South Dakota State Univ.

12:00-1:00 **Lunch**, Nicollet Grand
Ballroom B/C/D

19A2 2210
armored units

gpscopy.com

gpspassion.com

Wade
Horn
Wade Hayes

pocketpc magazine

Mon AM
~314



7th International Conference on Precision Agriculture

Practitioner A-Z Track

MONDAY, JULY 26

Afternoon Sessions

1:00 - 3:00 **Track 1 – GIS Software Reviews**, Regency Moderator:
Reed Hoskinson, Idaho National Engineering and Environmental Laboratory

1:00 ----- JDOOffice, T. McMurren, John
Deere Ag Management Solutions

1:20 ----- SSToolbox and SST Summit, D.
Waits, SST

1:40 ----- SGIS, N. Wollenhaupt, Global
Technologies by AGCO

2:00 ----- AGIS GPC, J. Wagner, AgRePlan

2:20 ----- MapCalc, E. McCallum, Red Hen
Farming Systems

2:40 ----- SMS Advanced, M. Vos, AgLeader
Technology

3:00-3:20 **Break** (Greenway Balcony)

3:20-5:00 **Poster Session** (Exhibit Hall)

5:00 **Reception** (Exhibit Hall)

1:00-3:00 **Track 2 – Tools for Nutrient Management Planning**,
Greenway J

1:00 ----- Manure Management Planner, B.
Joern, Purdue University

1:20 ----- Manure Management Planner, B.
Joern, Purdue University

1:40 ----- Spatial Nutrient Management
Planner, J. Lory, Univ. Missouri

2:00 ----- Spatial Nutrient Management
Planner, J. Lory, Univ. Missouri

2:20 ----- Nutrient Management Planner for
Minnesota, K. Blanchet, Univ.
Minnesota

2:40 ----- Nutrient Management Planner for
Minnesota, K. Blanchet, Univ.
Minnesota

3:00-3:20 **Break** (Greenway Balcony)

3:20-5:00 **Track 2 (cont.) – Growing Higher Yields**, Greenway J.
Moderator: *Scott Murrell, Potash and Phosphate Institute*

3:20 ----- Research challenges for high yield
growers, P. Fixen, Potash and
Phosphate Institute

3:40 ----- Minnesota research on higher
yields, G. Randall, Univ.
Minnesota

4:00 ----- Managing nutrients for higher
yields, B. Gordon, Kansas State
Univ.

4:20 ----- Placing nutrients for higher yields,
T. Vyn, Purdue Univ.

4:40 ----- Expanding the root zone, J.
Shefers and G. Carlson, South
Dakota State Univ.

5:00 **Reception** (Exhibit Hall)

5:00 **Poster Session** (Exhibit Hall)

7th International Conference on Precision Agriculture

Practitioner A-Z Track



MONDAY, JULY 26

Afternoon Sessions

1:00-3:00 **Track 3 – Hands on Software Tutorials**, Mirage

- 1:00 ----- Analytical Tool Box, G. Carlson, South Dakota State Univ.
- 1:20 ----- Analytical Tool Box, G. Carlson, South Dakota State Univ.
- 1:40 ----- Analytical Tool Box, G. Carlson, South Dakota State Univ.
- 2:00 ----- Analytical Tool Box, G. Carlson, South Dakota State Univ.
- 2:20 ----- Analytical Tool Box, G. Carlson, South Dakota State Univ.
- 2:40 ----- Analytical Tool Box, G. Carlson, South Dakota State Univ.

3

3:00-3:20 **Break** (Greenway Balcony)

3:20-5:00 **Track 3 (cont.) – Hands on Software Tutorials**, Mirage

- 3:20 ----- Nutrient Management Planner for Minnesota, K. Blanchet, Univ. Minnesota
- 3:40 ----- Nutrient Management Planner for Minnesota, K. Blanchet, Univ. Minnesota
- 4:00 ----- Nutrient Management Planner for Minnesota, K. Blanchet, Univ. Minnesota
- 4:20 ----- Nutrient Management Planner for Minnesota, K. Blanchet, Univ. Minnesota
- 4:40 ----- Nutrient Management Planner for Minnesota, K. Blanchet, Univ. Minnesota

4

5:00 **Reception** (Exhibit Hall)

5:00 **Poster Session** (Exhibit Hall)





7th International Conference on Precision Agriculture

Practitioner A-Z Track

TUESDAY, JULY 27

Morning Sessions

8:00-9:20 **Track 1 – PDA Software**,
Regency. *Moderator: John Norman, Dept. Soil Science, Univ. Wisconsin-Madison*

8:00 ----- SST Stratus and SST Summit, M. Waits, SST

8:20 ----- AgCode's Field Data System using Symbol PDAs, D. Harste, AgCode

8:40 ----- A custom ArcPad scouting solution, J. Johnson, Institute for Technology Development

9:00 ----- Customizing ArcPad, B. Koostra, Univ. Kentucky

9:20-9:40 **Break** (Greenway Balcony)

9:40-11:00 **Track 1 (cont.) – Automatic Guidance Systems**, Regency. *Moderator: John Hummel, USDA-ARS, Cropping Systems and Water Quality Research Unit, Columbia, MO*

9:40 ----- Farm applications of guidance systems, C. Mitchell, The Mitchell Farm

10:00 ---- Automatic guidance systems as management tools, G. Wagner, A.W.G. Farms

10:20 ---- AutoSteer, B. Kuehnast, AutoFarm

10:40 ---- BEELINE Navigator Row Crop, D. Pikop, BEELINE Technologies

11:00-12:00 **Poster Session** (Exhibit Hall)

12:00-1:30 **Luncheon** (Nicollet Grand Ballroom B/C/D)

8:00-9:20 **Track 2 – Using Yield Monitor Data**, Greenway J. *Moderator: T. Colvin, USDA-ARS, National Soil Tilth Laboratory*

8:00 ----- Collecting quality yield monitor data, S. Shearer, Univ. Kentucky

8:20 ----- Cleaning yield monitor data, S. Drummond, USDA-ARS

8:40 ----- Identifying zones with yield monitor data, G. Carlson, South Dakota State Univ.

9:00 ----- Identifying consistently profitable areas, S. Murrell, Potash and Phosphate Institute

9:20-9:40 **Break** (Greenway Balcony)

9:40-12:00 **Track 2 (cont.) – Using EC and Soil Test Data**, Greenway J. *Moderator: Scott Murrell, Potash and Phosphate Institute*

9:40 ----- Ways of measuring EC in the field, K. Sudduth, USDA-ARS

10:00 ---- How are EC data being used?, E. Lund, Veris Technologies

10:20 ---- Using EC-on the farm, J. Poore, Simplot

10:40 ---- Approaches for managing soil test levels, D. Leikam, Kansas State Univ.

11:00----- Strategies to variably manage nutrients: Do they work?, R. Khosla, Colorado State Univ.

11:20----- Site-Specific nutrient management: A Midwest case study, L. Murrell, Lance Murrell Consulting

11:40----- Evaluating nutrient budgets with soil test data, S. Murrell, Potash and Phosphate Institute

12:00 -1:30 **Luncheon** (Nicollet Grand Ballroom B/C/D)

7th International Conference on Precision Agriculture

Practitioner A-Z Track



TUESDAY, JULY 27

Morning Sessions

8:00 - 9:20 **Track 3 – Hands on Software Tutorial**, Mirage

8:00 ----- Manure management planner, B. Joern, Purdue Univ.

8:20 ----- Manure management planner, B. Joern, Purdue Univ.

8:40 ----- Manure management planner, B. Joern, Purdue Univ.

9:00 ----- Manure management planner, B. Joern, Purdue Univ.

9:20-9:40 **Break** (Greenway Balcony)

9:40 - 11:00 **Track 3 (cont.) – Hands on Software Tutorial**, Mirage

9:40 ----- Yield editor: Cleaning yield monitor data, S. Drummond, USDA-ARS

10:00 ---- Yield editor: Cleaning yield monitor data, S. Drummond, USDA-ARS

10:20 ---- Yield editor: Cleaning yield monitor data, S. Drummond, USDA-ARS

10:40 ---- Yield editor: Cleaning yield monitor data, S. Drummond, USDA-ARS

11:00-12:00 **Poster Session** (Exhibit Hall)

12:00-1:30 **Luncheon** (Nicollet Grand Ballroom B/C/D)





7th International Conference on Precision Agriculture

Practitioner A-Z Track

TUESDAY, JULY 27

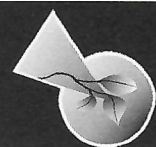
Afternoon Sessions

- 1:30-2:30 **Track 1 – Remote Sensing I**, Regency. Moderator: Galen Hart, USDA-ARS, Beltsville, MD
- 1:30 ----- Digital Globe, J. Ahlrichs, Digital Globe
- 1:50 ----- Real time soil mapping with a traveling spectrophotometer, S. Shibusawa, Tokyo Univ. of Agriculture
- 2:10 ----- Full Internet Services to Assist Crop Scouting and Variable Rate Fertilization, D. Lepoutre, Geosys
- 2:30-2:50 **Break** (Greenway Balcony)
- 2:50-3:50 **Track 1 – Remote Sensing II**, Regency. Moderator: Galen Hart, USDA-ARS, Beltsville, MD
- 2:50 ----- Remote sensing for nitrogen management, S. White, Institute for Technology Development
- 3:10 ----- GreenSeekerTM optical sensor applicator, J. Solie, Oklahoma State Univ.
- 3:30 ----- InSite Variable Rate Nitrogen (VRN), D. Froehlich, Cargill Crop Nutrition
- 3:50-5:00 **Poster Session** (Exhibit Hall)
- 5:00-6:30 **Reception** (Exhibit Hall)
- 6:30 **Banquet** (Nicollet Grand Ballroom B/C/D)

- 1:30-2:30 **Track 2 – International Organization for Standardization**, Greenway J
- 1:30 ----- Precision Agriculture and ISO 9001/14001, S. Rolph, Univ. Minnesota and J. Larson, Valhalla Farms, Willmar, Minnesota.
- 1:50 ----- Precision Agriculture and ISO 9001/14001, S. Rolph, Univ. Minnesota and J. Larson, Valhalla Farms, Willmar, Minnesota.
- 2:10 ----- Precision Agriculture and ISO 9001/14001, S. Rolph, Univ. Minnesota and J. Larson, Valhalla Farms, Willmar, Minnesota.
- 2:30-2:50 **Break** (Greenway Balcony)
- 2:50-3:50 **Track 2 (cont.) – Image Visualization**, Greenway J
- 2:50 ----- 3-D Image Visualization with GeoWall, J. Swenson, Univ. Minnesota
- 3:10 ----- 3-D Image Visualization with GeoWall, J. Swenson, Univ. Minnesota
- 3:30 ----- 3-D Image Visualization with GeoWall, J. Swenson, Univ. Minnesota
- 3:50-5:00 **Poster Session** (Exhibit Hall)
- 5:00-6:00 **Reception** (Exhibit Hall)
- 6:30 **Banquet** (Nicollet Grand Ballroom B/C/D)

7th International Conference on Precision Agriculture

Practitioner A-Z Track



TUESDAY, JULY 27

Afternoon Sessions

1:30-2:30 **Track 3 – Hands on Software Tutorials**, Mirage

1:30 ----- Identifying consistently profitable areas, S. Murrell, Potash and Phosphate Institute

1:50 ----- Identifying consistently profitable areas, S. Murrell, Potash and Phosphate Institute

2:10 ----- Identifying consistently profitable areas, S. Murrell, Potash and Phosphate Institute

2:30-2:50 **Break** (Greenway Balcony)

2:50-3:50 **Track 3 – Hands on Software Tutorials**, Mirage

2:50 ----- Identifying zones with yield monitor data, G. Carlson, South Dakota State Univ.

3:10 ----- Identifying zones with yield monitor data, G. Carlson, South Dakota State Univ.

3:30 ----- Identifying zones with yield monitor data, G. Carlson, South Dakota State Univ.

3:50-5:00 **Poster Session** (Exhibit Hall)

5:00-6:30 **Reception** (Exhibit Hall)

6:30 **Banquet** (Nicollet Grand Ballroom B/C/D)





7th International Conference on Precision Agriculture

Poster Session – Monday PM

ENGINEERING TECHNOLOGY

- 8 Two Methods of Mowing Machine Feed Rate Measurement Development and Testing
F. Kumhala, M. Kroulik, J. Masek, and V. Prosek*
- 9 Monitoring of Machine Operations by Means of GPS for Soil Tillage
J. Hula and P. Kovaricek*
- 10 Analysis of the ISO11783 CAN-Bus Based Protocol: Its Interpretation and Usage on a Precision Farming Application
A. Guimarães and A. Saraiva*
- 11 Software for Real-time Ultrasonic Mapping of Tree Canopy Volume
A. Schumann and Q. Zaman*
- 12 Instrumentation for Application Equipment to Apply Treatments Based on a Prescription Map in Olive Trees
M. Pérez Ruiz, J. Agüera Vega, and J. Gil Ribes*
- 13 Sweetpotato Yield and Grade Monitor Based on Image Analysis: Development and Field Testing
S. Gogineni, J. Thomasson, J. Wooten, R. Sui, and M. Shankle*

INFORMATION MANAGEMENT

- 26 Development of Nitrogen Response Curves Using Field Scale Data and Data Mining
A. Chaudhary, T. Colvin, D. Jaynes, and T. Kaspar*
- 27 CaNaSTA: A Spatial Decision Support System for Crop Niche Selection in Tropical Agriculture
*R. O'Brien, and S. Cook**
- 28 Agricultural Product and Food Security Tracking System Using GPS and Wireless Technologies
R. Hornbaker, V. Kindratenko, and D. Pointer*

NATURAL RESOURCES VARIABILITY

- 29 Spatial Analysis of Water Temperature Impact on California Rice Production
*A. Roel, R. Mutters, and R. Plant**
- 30 Study of Small-scale Spatial Variability of Winter Wheat Yield
X. Xue, L. Chen, Y. Pan, and C. Zhao*
- 31 Effect of Meteorological Elements on Regional-Scale Variation of Rice Growth During Early Stage
Y. Sasaki, S. Kawashima, M. Hayasaka, T. Kasai, K. Kakuda, T. Ishida, and H. Ando*

NEW APPLICATIONS WORLDWIDE

- 46 The Sowing Mechanism of Small Grain Vegetable Cultures
*A. Hakberdiev**
- 47 Sustainable Landuse Planning as a Basis for Precision Farming in Siwa Oasis, Western Desert of Egypt
*A. El Nahry**
- 48 Diseases and Insect Pests of Apple Trees Geographic Information System in Yantai
Z. Jian, F. Zetian, L. Gang, and Y. Longyong*

Note: Poster Boards are organized in the Exhibition Hall according to the green colored board number shown to the left of the poster title.

Please be sure to view three special posters in the Exhibition Hall. Poster Board 70 describes the Legacy of Pierre Robert. Poster Board 71 describes The Precision Agriculture Center at the University of Minnesota. Poster Board 72 publicizes the 5th European Conference on Precision Agriculture, To be held June 9-12, 2005 in Uppsala, Sweden.



PRECISION MANAGEMENT

- 49** A Comparison of Conventional and Variable Rate Lime Application Methods in South Louisiana Sugarcane Fields
*R. Johnson**, *E. Richard*,
- 50** Strategies for Site Specific Nitrogen Fertilisation on Winter Wheat
*F. Mäidl**, *J. Schächtl*, and *G. Huber*
- 51** On-farm Evaluation of SPAD Based Strategies for Efficient Nitrogen Management of Irrigated Rice in Northwestern India
*H. Khurana**, *S. Gupta*, *A. Sidhu*, *Y. Singh*, and *B. Singh*
- 52** Variable Rate Nitrogen Application in Florida Citrus Based on Ultrasonically-sensed Tree Size
*Q. Zaman**, *A. Schumann*, *W. Miller*, *S. Buchanon*, *K. Hostler*, and *G. Perkins*

PROFITABILITY

- 53** Economic Profits From Precise Application of Phosphorus and Potassium Fertilizers in Wielkopolska Region, Poland
*R. Pudelko**
- 54** Using Vegetation Indices Derived From Crop Reflectance Characteristics to Determine Nitrogen Deficiency in Tobacco
P. Shaker and *P. Fouché**

Note: Monday authors will be present by their posters from 4-5 pm. All Monday posters can be viewed at any time during the day. Authors, please remove your posters from the Exhibition Hall by 7:00 pm.

REMOTE SENSING

- 55** Remote Sensing Based Early and Late In-season N Management Decisions in Corn
*R. Sripada**, *R. Heiniger*, *J. White*, *R. Weisz*, and *C. Crozier*
- 56** Spectral Weed Detection in Water Stressed Conditions
*E. Vrindts**, *J. De Baerdemaeker*, and *A. Mouazen**
- 73** Influence of Growth Stage and Cultivar on Laser-induced Chlorophyll Fluorescence Measurements of Wheat Canopies
J. Schächtl, *F. Mäidl**, *G. Huber*, and *E. Stickse*
- 74** Dynamic Biomass Formula for the Estimation of Biomass of Selected Crops With a Hand-held Spectrometer
*A. Schmid** and *F. Mäidl*
- 75** RAMIS : A New Portable Field Radiometer to Estimate Leaf Biochemical Content
*G. Pavan**, *S. Jacquemoud*, *L. Bidet*, *C. François*, *G. de Rosny*, *J. Rambaut*, and *J. Frangi*
- 76** Insect Pest and Disease Detection Using Remote Sensing Techniques
*W. Riedell**, *S. Osborne*, and *L. Hesler*
- 77** Turf Biomass and Quality Assessment Using Remote Sensing.
*G. Horst**, *K. Holland*, *R. Shearman*, and *J. Schepers*
- 78** Automatic Delineation of Vine Fields by Segmentation of High Resolution Remote Sensing Images
*J. Da Costa** and *C. Germain*
- 79** Classification of Satellite Imagery for Predicting Yield Variation in Cranberry
*P. Oudemans**, *L. Pozdnyakova*, and *M. Hughes*
- 80** Early Season Cotton Acreage Assessments Using Multi-temporal, Multi-sensor Satellite Data Sources
*J. Ahlrichs**, *C. Woodward*, *J. Paris*, and *B. Woodruff*



7th International Conference on Precision Agriculture

Poster Session – Tuesday AM

EDUCATION/OUTREACH

- 13 Organizing Learning Groups Aiming at Community-based Precision Agriculture in Japan
*S. Shibusawa**
- 14 OpenAg.Info: Open Courseware for Geospatial and Precision Technologies
D. Crouse, J. Jenkins, R. Austin, J. Thompson, G. Roberson,*

ENGINEERING TECHNOLOGY

- 18 Evaluating Slope Sensing and Surface Modeling Techniques to Map Topography Changes Within a Field
R. Barbosa, J. Wilkerson, D. Yoder, and P. Denton*

ENVIRONMENT

- 19 Temporal Pattern and Spatial Complexity of Shallow Groundwater Nitrate in a Coastal Plain Agricultural Field
N. Hong, J. White, M. Gumpertz, and R. Weisz*

Note: To leave messages for conference attendees, please use Poster Board 69 in the Exhibition Hall. The Exhibition Hall is open from Monday morning through Tuesday afternoon, and on Sunday from 5:00-7:00 pm.

MODELING

- 20 Managing Spatial Variability of N-Mineralisation Within a Field
*T. Karlsson**
- 21 Optimization of Soil Physical State in Precision Agriculture: Conceptual and Experimental Approaches
*V. Kudrjashov**

NATURAL RESOURCES VARIABILITY

- 30 Relations Between Electrical Conductivity, Soil Texture and Chemical Properties on a Clay Soil in Southern Norway
*A. Korsæth**
- 31 Temporal Evaluation of Reclaiming Salt-Affected Soil
R. Horney, F. Cassel, B. Taylor, D. Munk, B. Roberts, and R. Plant*
- 32 Spatial and Temporal Variability in Electrical Conductivity and Their Relationship to Soil Characteristics in Indiana Soils
*R. Omonode**
- 33 The Impact of Forest Harvest Operations on Select Soil Properties of a Piedmont Hillslope
E. Carter, J. Owen, and J. Shaw*
- 34 Relationships Between Yields and Soil Chemical Fertility on Sedimentary Soils of Southern Brazil
D. Focht and G. Roloff*
- 35 Estimating Spatial Soil Water Content to Improve Spatial Yield Predictions
*S. Staggenborg**



NEW APPLICATIONS WORLDWIDE

- 39 Application of Traditional Wisdom of the Peasantry as the Natural Resource Management in Dry Land Agriculture
P. Kanani and V. Savaliya*
- 40 Efficient Nitrogen Management Technologies for Wet-direct Seeded Rice in Northwestern India
S. Gupta, C. Khind, B. Singh, Y. Singh, H. Khurana,*
- 41 Delineation of Management Zone for Wheat/Soybean-corn Sequence Using Remote Sensing
R. Melchiori, A. Kemerer, and A. Brizuela*
- 42 An Integrated Spatial Information Services Platform for PA Under Different Production Scales
Y. Pan, X. Xue, C. Zhao, J. Wang, and X. Wang*

PRECISION MANAGEMENT

- 48 Alfalfa Yield Maps and Management Zones From Satellite Images Aid in Diagnosing Field Production Problems
J. Schmierer, D. Munier, and J. Ahlrichs*
- 49 Emergence Date Affects Growth and Fecundity of Redroot Pigweed
E. Uscanga-Mortera, F. Forcella, S. Clay, and J. Gunsolus*

REMOTE SENSING

- 54 The Effect of Soil Ph and Moisture Content on Reflectance Spectra of Sandy Soils
I. Bogrekci and W. Lee*
- 55 Tillage and Management Effects on Soil and Wheat: Application of Real-time Soil Spectrophotometry and Multispectral Imagery
C. Hache, S. Shibusawa, A. Sasao, S. Prasad Sah, T. Suhamo, and S. Hirako*
- 56 Pattern Recognition Technology for Precision Agriculture on North-West of Russia
V. Badenko, N. Arefiev, and V. Yakushev*
- 57 Development of Low-cost Aerial Photography System for Visible and NIR Images
H. Shimada, T. Nagayoshi, E. Shima, and K. Tanaka*
- 58 Improvement of the Real-time Soil Spectrophotometer
T. Kaho, E. Morimoto, S. Shibusawa, S. Hirako, and N. Kondo*
- 59 Remotely Detecting Tomato Late Blight for Precision Disease Management
M. Zhang, Z. Qin,*

Note: Tuesday AM authors will be present by their posters from 11am-noon. All Tuesday posters can be viewed at any time during the day.



7th International Conference on Precision Agriculture Poster Session – Tuesday PM

CROP QUALITY

- 9** Mobile Fruit Grading Robot for Information-Added Products
*J. Qiao**, *S. Shibusawa*, *A. Sasao*, *E. Morimoto*, and *N. Kondo*
- 10** Relationship Between Rice Grain Quality and Soil Characteristics
*C. Marchesi**, *R. Mutters*, *J. Thompson*, and *R. Plant*
- 11** Effect of Topography, N Fertilization and Fungicide Application on Diseases, Yield and Seed Quality of Canola in North-Central Saskatchewan
*R. Kutcher** and *S. Malhi**
- 12** Effect of Topography, N Fertilization and Fungicide Application on Leaf Spot Diseases, Yield, and Seed Quality of Wheat in North-Central Saskatchewan
*S. Malhi** and *R. Kutcher*

ENGINEERING TECHNOLOGY

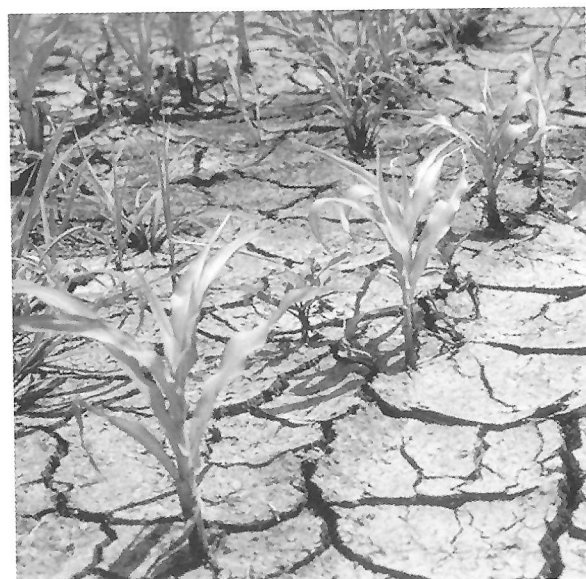
- 25** Soil Spectrum Pattern Classification for Real Time Soil Sensor Using Cluster Analysis
*E. Morimoto**, *S. Shibusawa*, *T. Kaho*, and *S. Hirako*
- 26** Improvement of Measurements With Real-time Soil Spectrophotometer
*Y. Kato**, *S. Shibusawa*, *T. Kaho*, *E. Morimoto*, and *A. Sasao*
- 27** Improving Agricultural Operational Efficiency With Wireless Communication
*R. Hornbaker** and *A. Hansen*
- 28** Landmapper™ ERM-01. Electrical Resistivity Mapping Device for Precision Horticulture
*L. Pozdnyakova**, *P. Oudemans*, *A. Pozdnyakov*, and *M. Kelly*
- 29** Pesticide Application in Precision Agriculture
*A. Bozdogan** and *N. Yarpuz Bozdogan*

GEOSTATISTICS/SAMPLING

- 15** A Generalized Analysis of Spatial Variance of Field Crops
*D. Clifford**, *A. McBratney*, *J. Taylor*, and *B. Whelan*
- 16** Sampling Strategies for Crop Yield Assessment Within and Among Crop Rotations
*A. Jaradat**, *D. Archer*, *J. Johnson*, *S. VanKempen*, *S. Wagner*, and *J. Eklund*
- 17** Quality Assessment of Yield Monitor Data
*J. Perez-Quezada**, *E. Laca*, and *R. Plant*

NATURAL RESOURCES VARIABILITY

- 36** Spatial and Temporal Variability of Alfalfa Recovering From Drought
*D. Hancock** and *M. Collins*
- 37** Spatial Variability of Crop Yields in Different Management Systems
*A. Kravchenko**, *G. Robertson*, *K. Thelen*, and *R. Harwood*
- 38** Site-Specific Arthropod Pest Damage and Abundance Among Management Zones
*S. Davidson** and *F. Peairs*





NEW APPLICATIONS WORLDWIDE

- 44** Adding Analytical Processing Layer to Agri Data Warehouse: Experiences and Results
A. Abdullah, M. Umer, A. Malik, and S. Ali, F. Karim*
- 45** Decision Support Systems on the Internet Based on Meteorological Data for Farmers in Santa Catarina
L. Kinceler, E. Antunes, and B. Franklin*
- 46** The Research and Development of Variable Rate Fertilizer Application Techniques in China
*X. Wang**
- 47** Decision Support System for Selection of Farm Machinery in Dryland Agriculture Based on Timeliness and Precision
V. Mayande and I. Srinivas*

PRECISION MANAGEMENT

- 50** Precision Experiments for Precision Agriculture
*V. Semenov**
- 51** Precision Agriculture Technology to Plan and Manage a New Research and Extension Center
D. Claypool, H. Farahani, R. Belden, and L. Munn*
- 52** Soil Nitrate as a Predictor of Spatially Variable N Need for Corn
P. Scharf, N. Kitchen, K. Sudduth, and J. Davis*
- 53** Using Overlay Patterns of Soil Organic Content, Electrical Conductivity, and Diaprepes Root Weevil for delointeering Management Zones in Citrus
H. Li, J. Syvertsen, R. Stuart, C. McCoy, and A. Schumann*

REMOTE SENSING

- 60** Using Reflectance Measurements to Identify Nitrogen Stress in Wheat and Increase Revenue
D. Wright, V. Rasmussen, R. Ramsey, D. Baker, and J. Ellsworth*
- 61** Evaluating Existing Sensor-based Variable Nitrogen Technology for Spring Wheat Production in the Northern Great Plains.
S. Osborne and W. Raun*
- 62** Variable Nitrogen Fertilization by Tractor-mounted Remote Sensing
A. Link, J. Jasper, and H. Olfs*
- 63** Spectral Measurements of Sunlight-Induced Chlorophyll-Fluorescence With Potatoes Regarding N-Fertilization
C. Idelberger, and E. Stickel*
- 64** Estimating Plant Nitrogen Status in Irrigated Corn Using Ground-Based and Satellite Data
W. Bausch, K. Diker, J. Paris, and R. Khosla*
- 65** An Evaluation of a Leaf Chlorophyll Meter for Assessing Nitrogen Status of Potato
D. Wang, J. Wu, C. Rosen, and M. McNearney*
- 66** Characterization of Fertilizer and Manure Stressed Soil Images With Textural Analysis Using Real-time Soil Spectrophotometer
S. Roy, S. Shibusawa, T. Kaho, E. Morimoto, N. Kondo, and A. Sasao*
- 67** Remote Sensing and Petiole Nutrient Analysis for Cotton Nitrogen Management
S. Bajwa, A. Mishra, and M. Mozaffari*

Note: Tuesday PM authors will be present by their posters from 4-5 pm. All Tuesday posters must be removed from the Exhibition Hall by 7:00 pm.



7th International Conference on Precision Agriculture Exhibitor List

AGCO Global Technologies
5850 Opus Parkway
Minnetonka, MN 55343
Exhibit Booths 21 & 22

Agri ImaGIS Technologies
PO Box 159
Maddock, ND 58348
Exhibit Booth 30

Ag Leader Technology
2202 S Riverside Dr
Ames, IA 50010 --
Exhibit Booths 7 & 8

Auto Farm – SGS Unlimited
700 South 7th
Fargo, ND 58103
Exhibit Booth 26

Cargill Crop Nutrition
P.O. Box 9300 M.S. 19
Minneapolis, MN 55440
Exhibit Booth 19

DigitalGlobe
1900 Pike Road
Longmont, CO 80501
Exhibit Booth 18

FAA Wide Area Augmentation System (WAAS)
800 Independence Ave,
SW Washington, DC 20591
Exhibit Booth 36

Geometrics
2190 Fortune Dr
San Jose, CA 95131
Exhibit Booth 33

Geonics Limited
1745 Meyerside Drive
Mississauga, Ontario L5T 1C6
Canada
Exhibit Booth 15

Holland Scientific
5011 South 73rd St
Lincoln, NE 68516
Exhibit Booth 32

John Deere Ag Management Solutions
4140 NW 114th St
Urbandale, IA 50322
Exhibit Booths 4 & 5

Kee Technologies USA
27071 Mueller Pl #3
Sioux Falls, SD 57108
Exhibit Booth 27

Midwest Technologies
2864 Old Rochester Rd
Springfield, IL 62703
Exhibit Booth 23

NTech Industries, Inc.
740 S State St
Ukiah, CA 95482
Exhibit Booth 24

Omnistar, Inc.
8200 Westglen
Houston, TX 77063
Exhibit Booth 9

Potash & Phosphate Institute
3579 Commonwealth Rd
Woodbury, MN 55125
Exhibit Booth 3

Precision Ag Buyers Guide
37733 Euclid Ave
Willoughby, OH 44094
Exhibit Booth 6

Precision Partners
220 W Washington – Ste 205
Fergus Falls, MN 56537
Exhibit Booth 20

Raven Industries
205 E 6th St
Sioux Falls, SD 57104
Exhibit Booths 34 & 35

Rawson Control Systems, Inc.
116 2nd Street SE
Oelwein, IA 50662
Exhibit Booth 11

Red Hen Farming Systems, LLC
PO Box 2222
Fort Collins, CO 80522
Exhibit Booth 25

SATCONSYSTEM
Bundesstrasse 7
97531 Obertheres
Germany
Exhibit Booth 28

Spectrum Technologies, Inc.
23839 W Andrew Rd
Plainfield, IL 60544
Exhibit Booth 1

SST
824 N Country Club Rd
Stillwater, OK 74075
Exhibit Booths 37 & 38

Trimble Navigation Limited
9290 Bond St – Ste 102
Overland Park, KS 66214
Exhibit Booths 13 & 14

VEGA Venture, Inc.
2477 Shadywood Rd
– Ste 50
Excelsior, MN 55331
Exhibit Booth 16

Veris Technologies
601 N Broadway
Salina, KS 67401
Exhibit Booths 12 & 17

Yara – tec5Hellma, Inc.
Hanninghof 35
Duelmen 48249,
Germany
Exhibit Booth 2

Note: The exhibitor booths are located in the Exhibit Hall on the Main Level of the Hyatt Regency Hotel.