



**Precision Agriculture in  
Kentucky:  
Cooperating Researchers**  
University of Kentucky · College of Agriculture

D.W. Hancock and S.A. Shearer, Biosystems and Agricultural Engineering

Precision Agriculture (PA) encompasses a wide range of topics. Thus it requires a multi-disciplinary approach to studying these issues. Within the University of Kentucky College of Agriculture we have a tremendous team of researchers and field personnel that lend their expertise to this study. The following is an alphabetical listing of those who are working on PA research at the University of Kentucky and the projects that they are working on.

(Note: An \* indicates the lead or co-lead researcher for this project.)

**Researchers:**

Dr. Richard Barnhisel  
Professor  
Soil Mineralogy  
Agronomy  
Room N-122 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-8627  
[rbarnhis@uky.edu](mailto:rbarnhis@uky.edu)

**Grain Yield Monitor Accuracy**  
**Variable-Rate Seeding and Nitrogen Application\***  
**Variable-Rate P, K and Lime Application**  
**Distribution and Impact of Perennial Weeds**  
**Soil Sampling, Soil Surveys, and Sensors for Precision Agriculture**  
**Investigation of Machinery Limitations**  
**Explaining and Understanding Variability in Grain Yield**  
**Evaluation of the Effects of Topography Attributes on Yield\***  
**Sensors and Variable Rate Management**

Dr. Morris Bitzer  
Professor  
Grain Crop Research  
Agronomy  
Room N-122 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-3975  
[mbitzer@uky.edu](mailto:mbitzer@uky.edu)

**Variable-Rate Seeding and Nitrogen Application**  
**Sensors and Variable Rate Management**

Dr. Michael Collins  
Professor  
Forage Physiology  
Agronomy  
Room N-222 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-3358  
[mike2@uky.edu](mailto:mike2@uky.edu)

**Soil Sampling, Soil Surveys, and Sensors for Precision Agriculture**  
**Remote Sensing of Pasture Mass and Quality\***  
**Sensors and Variable Rate Management**

Dr. Mark Coyne  
Associate Professor  
Soil Biology  
Agronomy  
Room N-122 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-4202  
[mcoyn00@uky.edu](mailto:mcoyn00@uky.edu)

**Soil Sampling, Soil Surveys, and Sensors for Precision Agriculture**  
**Evaluating Nutrient Removal as a Basis for Nutrient Management\***

Dr. David L. Debertin  
Professor  
Production/Human Resource Ag  
Economics  
410 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-7258  
[ddeberti@uky.edu](mailto:ddeberti@uky.edu)

**Precision Farming Adoption in Kentucky: The Role of Capital Costs and Farm Size\***

Dr. Carl Dillon  
Associate Professor  
Ag Economics  
403 C. E. Barnhart Bldg  
Lexington, KY 40546-0276  
(859) 257-3267  
[cdillon@uky.edu](mailto:cdillon@uky.edu)

**Variable-Rate P, K and Lime Application**  
**Soil Sampling, Soil Surveys, and Sensors for Precision Agriculture**  
**The Economics of Precision Agriculture and Decision Aids\***  
**Explaining and Understanding Variability in Grain Yield**  
**Precision Farming Adoption in Kentucky: The Role of Capital Costs and Farm Size**  
**Spatial Applications for Agriculture: Educational Case Studies\***  
**Sensors and Variable Rate Management**  
**Outreach Education for Precision Agriculture**  
**Kentucky Precision Agriculture Education Consortium**  
**Assessment of Alternative Methods of Applying Precision Deep Tillage**  
**Improving Equipment for Variable-Rate Application**  
**Break-Even Analysis and Interest Rate Considerations in Precision Agriculture Adoption\***  
**Optimal Management Zone Size\***  
**Economic Advisory Aids for Precision Agriculture Users**

Dr. David Ditsch  
Associate Extension Professor  
Robinson Station  
Agronomy  
130 Robinson Road  
Jackson, KY 41339-9081  
(606) 666-2438  
[dditsch@uky.edu](mailto:dditsch@uky.edu)

**Remote Sensing of Pasture Mass and Quality**

Dr. Charles Dougherty  
Professor  
Grassland Mgt. & Utilization  
Agronomy  
Room N-222 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-3454  
[cdougher@uky.edu](mailto:cdougher@uky.edu)

**Remote Sensing of Pasture Mass and Quality**

Dr. Ron Fleming  
Associate Professor  
Ag Economics  
309 C. E. Barnhart Bldg  
Lexington, KY 40546-0276  
(859) 257-7271  
[rfleming@uky.edu](mailto:rfleming@uky.edu)

**The Economics of Precision Agriculture and Decision Aids**  
**Evaluation of the Effects of Topography Attributes on Yield\***  
**Precision Farming Adoption in Kentucky: The Role of Capital Costs and Farm Size**

John Fulton  
Research Specialist/PA  
Biosystems & Ag Engineering  
128 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-3000 x 119  
[jfulton@bae.uky.edu](mailto:jfulton@bae.uky.edu)

**Dynamic Testing of Force-Impetus Yield Monitors Under Rough Terrain Conditions**  
**Outreach Education for Precision Agriculture**  
**Improving Equipment for Variable-Rate Application**  
**Voice Activation to Scout Fields While Operating Machinery\***

Dr. J.D. Green  
Extension Professor  
Weed Science  
Agronomy  
Room N-106 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-4898  
[jdgreen@uky.edu](mailto:jdgreen@uky.edu)

## Distribution and Impact of Perennial Weeds

Dr. John Grove  
Associate Professor  
Soil Fertility Management  
Agronomy  
Room N-122 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-7310  
[jgrove@uky.edu](mailto:jgrove@uky.edu)

**Site-Specific Banding of Phosphorus/Potassium\***  
**Evaluating Nutrient Removal as a Basis for Nutrient Management\***  
**Using Trends in Soil Formation to Differentiate Crop Management Zones\***  
**Sensors and Variable Rate Management**

Steve Higgins  
Research Specialist/PA  
Biosystems & Ag Engineering  
128 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-3000 x 120  
[shiggins@bae.uky.edu](mailto:shiggins@bae.uky.edu)

**Grain Yield Monitor Accuracy**  
**Variability of High Value Components Within a Field**  
**Variable-Rate P, K and Lime Application**  
**Investigation of Machinery Limitations**  
**Dynamic Testing of Force-Impetus Yield Monitors Under Rough Terrain Conditions**  
**Improving Equipment for Variable-Rate Application\***

Paula Howe  
Supervisor  
WKREC Soil Laboratory  
P.O. Box 469  
Princeton, KY 42445-0469  
(270) 365-7541 x 217  
[phowe@uky.edu](mailto:phowe@uky.edu)

**Soil Characteristics and Yield**  
**Variable-Rate Seeding and Nitrogen Application**  
**Varying Nitrogen Rates Based on Yield Maps**

Dr. Gregg Ibendahl  
Professor  
Farm Management  
Ag Economics  
316 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-3616  
[gibendahl@uky.edu](mailto:gibendahl@uky.edu)

**The Economics of Precision Agriculture and Decision Aids**

Dr. Steve Isaacs  
Extension Professor  
Ag Economics  
303 C. E. Barnhart Bldg  
Lexington, KY 40546-0276  
(859) 257-7255  
[sisaacs@uky.edu](mailto:sisaacs@uky.edu)

**Variable-Rate P, K and Lime Application**  
**The Economics of Precision Agriculture and Decision Aids**  
**Break-Even Analysis and Interest Rate Considerations in Precision Agriculture Adoption\***  
**Economic Advisory Aids for Precision Agriculture Users**

Dr. Anastasios Karathanasis  
Professor  
Soil Genesis-Morphology  
Agronomy  
Room N-122 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-5925  
[akaratha@uky.edu](mailto:akaratha@uky.edu)

**Soil Sampling, Soil Surveys, and Sensors for Precision Agriculture**  
**Explaining and Understanding Variability in Grain Yield**

Dr. James Martin  
Professor  
Weed Science  
Agronomy  
P.O. Box 469  
Princeton, KY 42445-0469  
(270) 365-7541 x 203  
[jamartin@uky.edu](mailto:jamartin@uky.edu)

## Distribution and Impact of Perennial Weeds

Dr. Sam McNeill  
Assistant Extension Professor  
Post-Harvest Grain Processing  
Biosystems & Ag Engineering  
P.O. Box 469  
Princeton, KY 42445-0469  
(270) 365-7541 x 213  
[smcneill@uky.edu](mailto:smcneill@uky.edu)

**Grain Yield Monitor Accuracy**  
**Variability of High Value Components Within a Field\***  
**Variable-Rate P, K and Lime Application**  
**Investigation of Machinery Limitations\***  
**Dynamic Testing of Force-Impetus Yield Monitors Under Rough Terrain Conditions**  
**Comparison of Two NIR Monitors for Corn and Wheat\***  
**Spatial Applications for Agriculture: Educational Case Studies**  
**Voice Activation to Scout Fields While Operating Machinery**

Dr. Michael Montross  
Assistant Professor  
Granular Mechanics  
Biosystems & Ag Engineering  
128 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-3000 x 120  
[montross@bae.uky.edu](mailto:montross@bae.uky.edu)

**Comparison of Two NIR Monitors for Corn and Wheat\***

Dr. Tom Mueller  
Assistant Professor  
Soil Management  
Agronomy  
Room N-122 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-8887  
[mueller@uky.edu](mailto:mueller@uky.edu)

**Grain Yield Monitor Accuracy**  
**Soil Characteristics and Yield**  
**Variable-Rate P, K and Lime Application**  
**Site-Specific Banding of Phosphorus/Potassium**  
**Soil Sampling, Soil Surveys, and Sensors for Precision Agriculture\***  
**Investigation of Machinery Limitations**  
**Explaining and Understanding Variability in Grain Yield\***  
**Remote Sensing of Pasture Mass and Quality**  
**Spatial Applications for Agriculture: Educational Case Studies Sensors and Variable Rate Management\***  
**Outreach Education for Precision Agriculture Kentucky Precision Agriculture Education Consortium Assessment of Alternative Methods of Applying Precision Deep Tillage Improving Equipment for Variable-Rate Application Voice Activation to Scout Fields While Operating Machinery Optimal Management Zone Size**

Dr. Lloyd Murdock  
Extension Professor  
Variable-Rate Fertility  
Agronomy  
P.O. Box 469  
Princeton, KY 42445-0469  
(270) 365-7541 x 213  
[lmurdock@uky.edu](mailto:lmurdock@uky.edu)

**Soil Characteristics and Yield\***  
**Variable-Rate Seeding and Nitrogen Application**  
**Variable-Rate P, K and Lime Application**  
**Potential of Precision Tillage**  
**Explaining and Understanding Variability in Grain Yield**  
**Varying Nitrogen Rates Based on Yield Maps**  
**Sensors and Variable Rate Management**

Dr. Scott Shearer  
Professor  
Machine Systems Automation  
Biosystems & Ag Engineering  
128 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-3000 x 218  
[shearer@bae.uky.edu](mailto:shearer@bae.uky.edu)

**Grain Yield Monitor Accuracy\***  
**Variability of High Value Components Within a Field**  
**Variable-Rate Seeding and Nitrogen Application**  
**Variable-Rate P, K and Lime Application\***  
**Potential of Precision Tillage**  
**Soil Sampling, Soil Surveys, and Sensors for Precision Agriculture\***  
**Investigation of Machinery Limitations\***  
**Explaining and Understanding Variability in Grain Yield**  
**Dynamic Testing of Force-Impetus Yield Monitors Under Rough Terrain Conditions\***

Dr. Scott Shearer (cont'd)

**Low Cost GPS-Based Sensors for High Speed Agricultural Vehicle Guidance**  
**Spatial Applications for Agriculture: Educational Case Studies\***  
**Sensors and Variable Rate Management**  
**Outreach Education for Precision Agriculture\***  
**Kentucky Precision Agriculture Education Consortium\***  
**Improving Equipment for Variable-Rate Application\***  
**Voice Activation to Scout Fields While Operating Machinery\***  
**Optimal Management Zone Size**

---

Dr. Tim Stombaugh  
Assistant Extension Professor  
Extension Specialist for PA  
Biosystems & Ag Engineering  
128 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-3000 x 214  
[tss@uky.edu](mailto:tss@uky.edu)

**Low Cost GPS-Based Sensors for High Speed Agricultural Vehicle Guidance\***  
**Sensors and Variable Rate Management\***  
**Outreach Education for Precision Agriculture\***  
**Assessment of Alternative Methods of Applying Precision Deep Tillage**  
**Improving Equipment for Variable-Rate Application**

---

Dr. Larry Wells  
Professor  
Machine Systems  
Biosystems & Ag Engineering  
128 C. E. Barnhart Bldg.  
Lexington, KY 40546-0267  
(859) 257-3000 x 219  
[lwells@bae.uky.edu](mailto:lwells@bae.uky.edu)

**Grain Yield Monitor Accuracy**  
**Potential of Precision Tillage\***  
**Investigation of Machinery Limitations**  
**Dynamic Testing of Force-Impetus Yield Monitors Under Rough Terrain Conditions**  
**Low Cost GPS-Based Sensors for High Speed Agricultural Vehicle Guidance**  
**Sensors and Variable Rate Management**  
**Assessment of Alternative Methods of Applying Precision Deep Tillage\***

---

Dr. William Witt  
Professor  
Weed Science  
Agronomy  
Room N-106 Ag. Sci.-North  
Lexington, KY 40546-00914  
(859) 257-1823  
[wwitt@uky.edu](mailto:wwitt@uky.edu)

**Distribution and Impact of Perennial Weeds\***

---

**Other Contributors:**

Rod Grusy  
Extension Agent for  
Agriculture & Nat. Resources  
Hardin County  
201 Peterson Drive  
Elizabethtown, KY 42701-9370  
(270) 765-4121  
[rgrusy@uky.edu](mailto:rgrusy@uky.edu)

Greg Henson  
Extension Agent for  
Agriculture & Nat. Resources  
McLean County  
P.O. Box 265  
Calhoun, KY 42327-0265  
(270) 273-3690  
[ghenson@uky.edu](mailto:ghenson@uky.edu)

Russell Morgan  
Area Farm Mgt. Specialist  
Purchase Farm Analysis Group  
P.O. Box 8028  
Paducah, KY 42002  
(270) 443-6634  
[pfagroup@apex.net](mailto:pfagroup@apex.net)

**For more information contact:**

Dennis Hancock,  
Ext. Associate for Precision Agriculture  
128 C.E. Barnhart Bldg  
Lexington, KY 40546-0276  
(859) 257-3000 x 119  
[dhancock@bae.uky.edu](mailto:dhancock@bae.uky.edu)