

## **Fertilizer & Lime 2007/200 Proposal**

**1. Title:** Evaluation of Dry Band Application of Total Crop Phosphorous and Potassium Nutrient needs for a No-till Corn/Soybean Rotation

**2. Investigators:** Rich Hoormann, Region Agronomy Specialist, Charlie Ellis, Region Natural Resources Engineer, Peter Scharf, Associate Professor of Agronomy, University of Missouri Extension

**3. Objectives:** The objectives of this study are to determine: The influence of sidedress band application of total P205/K20 fertilizer recommendations for corn and soybean rotation in a two year application, when compared to the broadcast rate. Yield results, crop stand and vigor will be measured to evaluate the practicality of this approach by farmers to minimizing fertilizer costs, while maintaining or increasing yield environment.

Many Missouri farmers find their profit margins being squeezed by increasing cash rent rates and high fertilizer costs. Land owners are not agreeing to share profit risk with renters, which leaves them at a high business risk. Farmers are looking to alternate methods of reducing fertilizer costs and are reading about information from states where sidedress fertilizer research has shown that broadcast rates can be reduced while maintaining yields. While the system has high plains and northern production research data, there is little Missouri data on the results of such an approach where a two year fertilizer recommendation is applied to meet a corn-soybean rotation need. This is routinely done broadcast by variable rate application and blanket applications.

Field information under Missouri soils and environment would indicate the value of such an approach by Missouri farmers and whether it could be recommended.

**4. Procedures:** A site with low phosphorus will be selected near the producer that is interested (already selected) in modifying a planter with dry fertilizer attachments. GPS referenced soil samples will be taken to locate a suitable low test phosphorous site and the field test plot positioned within an existing field. Compost sample averages will be used to determine the broadcast P205/K20 rate. Treatments will consist of 4 replications of 0 P205/K20, broadcast rate of soil test recommendation of P205/K20, broadcast rate in sidedress band, and ½ broadcast rate of P205/K20 in sidedress band. Bands will be on a 4x4 placement. Plots will be sized to accommodate harvest equipment, but will be field size, not small plots. Harvest will be with a GIS mapping equipped combine. This will be a three-year project because of the nature of the crop response to a two year fertilizer rate and the need to track yield and crop response.

**6. Timetable for proposed research:** We propose to begin this study in the spring of 2007 with site selection and soil sampling (Feb. through March), layout

in April and planting/fertilizer application in early May. A field day will be held in August of 2007. Year 2 will involve write up of data, presentation of work to date at Soils & Crops Conferences and a second field day in August. Year 3 will repeat the soil sampling, field day and final write up of data. PowerPoint presentations will be constructed and distributed.

**7. Strategy for application/transfer of knowledge:** The results of this study will be disseminated at field days to be held on site each year of the project and at region Soils & Crops Conferences and other local events. In addition to the reports required by the Fertilizer/Ag Lime program, a summary will be written for use by University of Missouri Extension staff and other interested organizations. PowerPoint presentations of the information will be provided for use by other Extension professionals in the State. Information will also be used in radio formats that cite research done in the state.

**8. Budget:** Proposed budget by years and by category.

Item	Description	2007	2008	2009
GIS equipment	software upgrade	600	0	0
Fertilizer	purchase	600	0	600
Soil Tests	90 pre and post @ \$12	540	0	540
Harvest Equipment	harvester, maintenance	300	300	300
Supplies	bags, markers, sign	250	250	250
Soil Probe Equip.	replacement tips/ probe	250	0	0
Field Days	3 @ \$500	500	500	500
Publication	printing, postage	300	300	300
Travel	2,550 miles	390	390	390
Sub total	by year	\$3730	\$1740	\$2880

Three year Grant total: \$8,350

**Resume:**

**Richard G. Hoormann**  
 310 Salisbury St., Suite E  
 Montgomery City, MO 63361  
 Cell phone: 314-651-2640  
 hoormannr@missouri.edu

**Summary:**

I am a professional agronomy educator, with a strong record of combining consultation, research, field work and electronic tools with teaching, to meet the needs of the farm

audience. I have experience in the farmer, USDA agencies and retailer education setting. Over my career I have demonstrated the ability to plan and follow through on education programming in a large geography. Successfully able to manage time and resources to achieve planned goals.

## **Major Career Responsibilities:**

History of developing and implementing agricultural education programs for a diverse farm audience.

Leadership of educational training, business strategies and sales staff programs for large farmers, retail staff and wholesale staff to enhance skill sets and performance.

Develop and maintain business relationships with retailers leading to greater sales.

Develop, organize, and implement agronomic sales staff training as the basis for retail sales.

Provide agronomic product support for seed, crop protectant and fertilizer sales staff in a multi- state area.

Assist key retail dealer employees with agronomy sales business plan development.

Instruct retail staff how to use the discovery process, in combination with agronomy skills, to meet farmers needs as part of the sales process.

## **Career History and Selected Achievements:**

**Region Agronomy Specialist,**

2005-

Present

University of Missouri

Responsibilities include identifying “teachable moment” opportunities, short term and long-term needs of clientele and implementing the plan-of-work as approved by the Regional Director. Responsible for the development of an overall agricultural education programs to meet the agricultural needs identified in the needs assessment process. Program management included developing logic models to produce desired changes and carry out the work necessary to evaluate markers identified in logic models.

Programs involve using a series of learning events such as meetings, newsletters, web base electronic news, demonstrations, field days, consultation and workshops to achieve program goals as assigned.

Responsible for developing and managing a long tem relationship with partnered organizations and stakeholders to implement educational programs identified in needs assessment by assigned counties.

Leadership of the Universities of Missouri's mission in the assigned area of work includes working closely with a variety of stakeholders including: commodity groups and volunteer and/or elected boards.

**Agronomist,**  
2003-2005  
RGH Associates  
St. Peters, MO

RGH Associates offered agronomy services to retail dealers. Services offered included: diagnostic services, field day support, on site retail staff training and field crop scout support. The key objective of training was to increase product and service sales with key growers by increasing the technical expertise of staff. On site training included obtaining certified education credits (CEU) for all technical training with sales agronomist.

Represent Monsanto Company, as a contract employee, investigating crop seed re-plant and crop protectant re-spray claims for the southern Illinois sales team. .

**Region Agronomist,**  
2000- 2003  
Agriliance LLC  
St. Paul, MN

As a region agronomist, I maintained close support of sales staff in states of MO, IL, KY and parts of IA. Duties included conducting proprietary product training for key customer staff and their key growers. Training was conducted in Field Days, plot tours, at retailer plants and one-on-one. The region agronomist facilitated business marketing planning with the sales team using the discovery process to position training and products. Cold calls were done in support of sales team identifying and targeting customers for new on site agronomic training business.

Detailed regional agronomist business plans were done for the top 20 percent of Agriliance customers in assigned region and monthly reviews of progress were required on the topics of on site training of customer, technical staff, product sales, product performance calls and technical newsletters issued. Twenty key accounts, representing some thirty locations, made use of agronomy services as part of a coordinated support plan.

Field diagnostic work and product support was carried out for the Croplan Genetics seed division. This included teaching in demonstrations and research field days, dealer plot tours, and on site problem solving. In addition, field data collection and product performance issues were part of field duties.

**Region Agronomist,**  
1995- 2000  
Farmland Industries, Inc  
Kansas City, MO

The region agronomist position included working in support of sales staff in a ten state area including the province of Ontario Canada. Accounts targeted were those within the top 20 percent of company sales. Duties included crop diagnostics work of production problems, product support and technical training for dealers. Management authority was given to developing technical content, agendas and teaching materials for dealer level technical schools on a wide variety of topics. Management also required all paper work for obtaining industry continuing education credits from the industries certifying body, American Society of Agronomy. Training activities were conducted in 1, 2 and 2 1/2 day blocks using multi-media techniques

Other duties included selling intern placement services for key accounts. Scheduling, interviewing, hiring, training and supervision of college interns placed at key retailers as part of the agronomist business responsibilities.

Field testing, customer training and general support of Farmland electronic tools such as GPS/GIS systems and field level Integrated Crop Management software was conducted for key customers involved in an industry setting environmental program titled AG•21. This support required team building with dealer staff in development of business plans for integrating new technologies. Coaching, counseling and follow-up facilitation of agronomy and environmental stewardship implementation plans required year round contact and planning with dealer general managers and key staff

Technical writing of newsletters, electronic crop tips for Internet postings and DTN customers was another duty to keep clientele abreast of the latest information. Duties also included communication with University Researchers key to future of the industry. This included selection of research in need of support and funding by Farmland Industries.

**Extension Region Agronomy/Natural Resources Specialist,**

1983- 1995

University of Missouri

Outreach & Extension

Duties include: Crops and soils technical support for small and commercial farmers and retail dealers. Responsible for the development of an overall agricultural education programs to meet the business and technical needs leading to the increased profitability of the agricultural community. Working with other disciplines on issued based programming topics to meet needs as identified by County Extension Council and other stakeholders. Program management included organizing the technical content and coordination of the meetings. Learning activities conducted and liaison with other organizations and stakeholders to implement the educational program included: NRCS, Soil & Water Districts in two counties, Missouri Corn Growers, Missouri Soybean Association, St. Louis County Vegetable Growers Association, Lincoln University, Missouri Botanical Gardens, Jefferson College, East-Central College, Missouri Department of Agriculture and other agriculture related groups.

I provided the leadership role for the Universities of Missouri's Outreach and Extension mission, in my assigned territory as both a county staff member and as a CPD. Duties included working monthly with volunteer and elected boards, including county elected officials.

**Extension Instructor,**

1980- 1983

University of Nebraska

Cooperative Extension

**Research Assistant,**

1978- 1979

Southern Illinois University at Carbondale

**Skills:**

Developing and maintaining clientele relationships. Functioning as part of a team and adapting to new roles in business models within organizations as clientele needs change.

Using the following skill sets to accomplish assigned goals:  
Managing research projects, office staff management, budgets,

business plan development, customer service, technical education material development, technical writing, field diagnostic skills, field demonstrations management.

Training: Coaching for High Performance, Time and Territory Management, Selling Essentials, SGIS precision Ag software, AgInfo software

Certified Crop Advisor (ARPACS), 1996

## **Education:**

**Bachelor of Science** Southern Illinois University at Carbondale 1978  
Major: Plant & Soil Science

**Masters of Science** Southern Illinois University at Carbondale 1981  
Major: Plant & Soil Science

## **Charles Ellis**

Natural Resource Engineering/County Program Director  
Lincoln County Extension Center  
Troy, MO 63379  
Ph. 636-52804613

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### PROFESSIONAL PROFILE

Since July 1, 1991 has been the Natural Resource Engineer for the East Central Extension Region. Duties have included working in the areas of crop production, livestock production, on-site septic systems and watershed quality issues. Beginning in 1996 have been involved in precision farming practices in the East Central Region as well as state wide.

### PROJECTS AND PAPERS

Assisting farmers in adopting precision farming practices that include yield mapping, grid soil sampling, light bar usage and sensing technology.

The Northeast Missouri GPS equipped fertilizer cart to convert a commercial tractor drawn fertilizer cart to variable rate capabilities.

Evaluation of "Low Cost" GPS receivers for yield mapping and presentation at ASAE conference.

Variable rate applications of nitrogen in corn using Greenseeker technology.

Nitrogen management in corn using new sensing technologies.

Conversion of CRP ground to no-till crop production.

Assisting local grain producers in developing yield mapping experience on approximately 5000 acres per year.

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## CERTIFICATIONS

CCA

Vegetable Oil Extraction Short Course

### **Peter Clifton Scharf**

Nutrient Management Specialist and Associate Professor  
Plant Sciences Division  
108 Waters Hall  
University of Missouri  
Columbia, MO 65211

#### **Research and Extension education interests**

C developing, evaluating, and promoting tools to predict crop N needs, including variable-rate N management

C minimizing environmental impacts of agricultural nutrients

C optimizing nutrient and lime management for crop production

C tailoring nutrient recommendations to account for soil properties

#### **Education**

*Degree Date Institution Major*

Ph.D. May 1993 Virginia Polytechnic Inst. Crop & Soil  
and State University Environmental  
Sciences

M.S. July 1988 Virginia Polytechnic Inst. Agronomy  
and State University

B.S. August 1982 University of Wisconsin Biochemistry,  
Genetics

#### **Selected Research Publications**

Scharf, P.C., N.R. Kitchen, K.A. Sudduth, and J.G. Davis. 2006. Spatially variable corn

yield is a weak predictor of optimal nitrogen rate. *Soil Sci. Soc. Am. J.* 70:2154-2160.

Scharf, P.C., S.M. Brouder, and R.G. Hoefl. 2006. Chlorophyll meter readings can predict nitrogen need and yield response of corn in the north-central U.S. *Agron. J.*

98:655-665.

Cromley, S.M., W.J. Wiebold, P.C. Scharf, and S.P. Conley. 2006. Hybrid and planting date effects on corn response to starter fertilizer. Online. Crop Management doi:10.1094/CM-2006-0906-01-RS.

Scharf, Peter C., Newell R. Kitchen, Kenneth A. Sudduth, J. Glenn Davis, Victoria C. Hubbard, and John A. Lory. 2005. Field-scale variability in optimal N fertilizer rate for corn. *Agron. J.* 97:452-461.

Scharf, Peter C. and William J. Wiebold. Soybean yield responds minimally to nitrogen applications in Missouri. 2003. Online. Crop Management doi:10.1094/CM-2003-1117-01-RS.

Lory, John A. and Peter C. Scharf. 2003. Yield goal versus delta yield for predicting fertilizer nitrogen need in corn. *Agron. J.* 95:994-999.

Scharf, Peter C., John P. Schmidt, Newell R. Kitchen, Kenneth A. Sudduth, S. Young

Hong, John A. Lory, and J. Glenn Davis. 2002. Remote sensing for nitrogen management. *J. Soil Water Cons.* 57:518-524.

Scharf, Peter C. and John A. Lory. 2002. Calibrating corn color from aerial photographs to predict sidedress N need. *Agron. J.* 94:397-404.

Scharf, Peter C., William J. Wiebold, and John A. Lory. 2002. Corn yield response to nitrogen fertilizer timing and deficiency level. *Agron. J.* 94:435-441.

Hellwig, K. B., W. G. Johnson, and P. C. Scharf. 2002. Grass weed interference and nitrogen accumulation in no-tillage corn. *Weed Sci.* 50:757-762.

### **Selected Extension Publications**

Scharf, Peter and John Lory. 2006. Best Management Practices for nitrogen fertilizer in Missouri. 12-page manual. MU Extension publication IPM1027.

Scharf, Peter. 2006. Color of corn leaf shows needed nitrogen for crop. *MidAmerica Farmer Grower*, June 30, 2006, p. 8-9.

Scharf, Peter. 2006. Fertilizer efficiency—What's the limit? *Integrated Pest & Crop Management* 16:30-31.

Scharf, Peter and Harlan Palm. 2005. The color of green: sensors cast light on how corn growers can use less nitrogen. Press release through MU Extension & Ag Information.

Houghton, Dean. 2005. Rescue N: When? *The Furrow*, summer 2005 p. 7-8.

Using information from Peter Scharf.

Scharf, Peter and Larry Mueller. 2005. Fall-applied N may be lost. Integrated Pest & Crop Management 15:35-36.

Wehrspann, Jodie. 2004. Spend fertilizer dollars wisely. Farm Industry News, Oct. 2004. Using information from Peter Scharf.

Scharf, Peter. 2004. Rain and nitrogen: a bad combination. Integrated Pest & Crop Management 14:70.

Scharf, Peter. 2004. Nitrogen carryover after low-yielding corn. Integrated Pest & Crop Management 14:25.

Scharf, Peter. 2004. Early urea applications. Integrated Pest & Crop Management 14:14,16.

Scharf, Peter. 2004. Changes in the nitrogen fertilizer industry: higher prices, more imports, more urea, and more UAN solution. Integrated Pest & Crop Management 14:17.

Scharf, Peter. 2004. Proper soil pH reduces atrazine carryover in no-till rotations. Missouri CCA News, January 2004 p. 3-4.

Reichenberger, Larry. 2004. An eye for nitrogen. Successful Farming, Feb. 2004. Using information from Peter Scharf.