Tenured Faculty Review

Jim Leverich, Professor, Department of Ag and Natural Resources
On Farm Research Coordinator, UW-Extension

I. Program Development and Implementation

Situation:
Environmental performance of US/WI agriculture is an increasingly important public policy issue. Agricultural farming practices can have a substantial impact on our stream, groundwater, and air quality. Producers need research and extension information to help them select current and emerging practices which help them improve their environmental performance and at the same time maintain and improve their profitability.

Response:
To help producers to maintain and improve environmental performance and profitability, I have been assigned to develop environmental and economic farming system research and build collaboration between researchers, farmers, extension agents and specialists to conduct these research projects. We are studying how farming systems can be managed to help producers and consultants to improve environmental performance and farm profitability. Our main research theme is: **Using UW System Basic and On-Farm Research to Enhance Agricultural Environmental and Financial Performance.**

I work very closely with Dr. Tom Cox, an Ag and Applied Economics professor, to collaborate and coordinate research in these areas. Tom provides the CALS portion of the partnership and I provide the Extension piece of our partnership when we work on research projects with our partners. This strong partnership gives us the opportunity to develop many partnerships with CALS/ARS researchers, extension specialists and agents, agencies, producers, consultants and organizations.

Outcomes:
We have been able to build collaboration among researchers from many different disciplines and with many agencies and producers in each of our research areas. This teamwork allows scientists from many different disciplines to share their expertise so we can provide whole farming system solutions. Extension specialists link our research to appropriate extension teams and we also deliver results through teaching events linked to our research and through state, regional, and national events which are related to our research programs. Teamwork with several collaborators in each project is essential to our success.

Each of the projects are independent, but they are focused on "**Enhancing Environmental and Financial Performance"** through our collaboration and coordination of research and extension efforts. Below I will describe each of the research projects and the outcomes of these projects.

A. Accelerated Renewable Energy Project (2012 to present)

I worked with the following partners to write and we were awarded a $7 million grant from the USDA Biomass Research and Development Initiative (BRDI). This Accelerated Renewable Energy (ARE) project is collaboration between the University of Wisconsin Extension and the University of Wisconsin-Madison Departments of Agricultural and Applied Economics, Biochemistry, Biological Systems Engineering, and Soil Science. Maple Leaf Dairy in Cleveland, Wisconsin is our farm collaborator and we are also have Soil Net, LLC (Madison), Braun Electric, Inc. (St. Nazianz), and FEECO International, Inc. (Algoma) as business collaborators in the project. This research is allowing us to study the economic as well as environmental aspects of manure separation and energy production systems.

Standard manure composition is often not well matched environmentally to crop and soil nutrient needs, thus by separating the manure and using precision ag technologies we are able to match nutrients much more efficiently to crop and soil needs. We can spoon feed the nutrients from these separated products more accurately because these products are more consistent in quality than agitated manures and some of the products can be irrigated throughout the growing season.

The separation can create many products, but the main three are a dry solid, a clear liquid high in nitrogen and potassium, and a heavy liquid concentrate which contains most of the phosphorus. All of these products can be applied with conventional solid and liquid spreaders and the thin liquids also have the potential to be easily irrigated in growing crops so most of the nitrogen is put on when the crop needs the nitrogen significantly reducing the risk of nitrogen loss. These products can be applied individually or can also be blended back together to appropriately match crop and soil needs.

In our research we are studying the efficiencies of these systems and the cost of nutrient application per unit of nutrient. The clear liquids high in nitrogen and potassium can be irrigated at a lower cost and throughout the growing season. The remaining concentrate has a higher level of nutrients per gallon hence making it more efficient to distribute nutrients farther away from the lagoons. This is because each gallon of manure has more nutrients, so our cost of moving nutrients farther is reduced. With the separated products we are applying what the crop needs rather than over-applying. We are also able to use precision ag technologies to more accurately apply this concentrate which is much more consistent in nutrient composition than standard agitated raw manure.

In these separation processes we are evaluating the use of polymers to enhance the efficiency of separation. We are also looking at using settling lagoons with and without polymers versus machines to do the separation. It may be possible to separate manure in the lagoons and extract the manure liquids in layers versus using agitation before application. The clear liquids on top of the lagoons can be irrigated and the liquids in the lower parts of the lagoon can be put on with conventional spreading and/or hose drag systems.

A large component of this project is that we are part of the Wisconsin Energy Institute. With manure separation we are learning how we might improve the efficiency of the digester by removing excess water and by removing some of the indigestible fiber and using it for bedding and/or mulch. We are also looking at using a macerator on the dry fibers to enhance the release of sugars bound in the manure fibers.

In addition to the bioenergy research a large part of our part in the project is to develop the field research for the irrigation of the nutrients and also to use the latest precision ag technologies to maximize the use efficiency of the nutrients in the manure products we are producing. From this research we are developing the BMPs and protocols for using these technologies on farms and working with the regulatory agencies to help them understand the new information we have from our research.

The results we are learning from this project should significantly enhance the economic and environmental performance of manure handling systems which will benefit both farmers and citizens of Wisconsin as we learn new ways to manage our manure resource. We haven't done a lot of delivery of results from this project yet as we are still in the research stage of the project. We expect to have many opportunities to deliver this information in extension programs in the future as more of our research data is analyzed and updated recommendations can be derived from our work. At this point we can only talk about the items we discussed above until we complete two more years of research and then we will be able to develop BMP from this research as well.

B. Conservation Innovation Grant: BMPs for Land Application of Liquid Manure (2009 to present)

We were awarded one of only two three year CIGs (Conservation Innovation Grants) awarded in Wisconsin. Our project was selected to study the economic and environmental costs/benefits of manure separation processing systems and how these systems can improve farm profitability and nutrient management. This research was tied to the Managing Manure with Precision Farming Tools Research which we conducted at Larson Acres in the early 2000's and was a precursor to us receiving the $7 million ARE research described above.

The concept of separation in this project is similar to the ARE project but uses different separation technology. Three main manure products produced in this separation process are, permeate which is about 60% of the volume, concentrate which is about 30% of the volume, and solids which are about 10% of the original volume. The permeate has a half of the total nitrogen and a majority of the potassium and can be irrigated in season thus reducing the risk of losing nutrients as the nutrients are applied as the crop is growing making nutrient utilization much more efficient. The concentrate has the remaining nitrogen which is less soluble and more stable for traditional hose or tanker application and most of the phosphorus. Manure nutrients can be irrigated rather than trucked between farms. Most of the phosphorus is removed from the raw manure, and concentrated into the concentrate portion thus it can be concentrated into a liquid that can be transported more economically.

This new separation technology removes the most soluble nitrogen, phosphorus and potassium nutrients from the liquid manure into permeate. Permeate is then applied with a center pivot irrigation system with intensive application monitoring. We developed the BMPs to use soil moisture sensors and irrigation modeling software to manage permeate applications. This ensures soluble nutrients are applied to the field only when the field needs moisture and the crops need nutrients. Several small applications of these soluble nutrients throughout the growing season ensure nutrients are used by crops before losses occur to reduce/eliminate runoff or leaching environmental losses. With soluble nutrients removed, the remaining manure is less soluble and will have a slower release of nutrients which will hold nutrients in the crop zone for more efficient use. Current application systems will follow BMPs to apply the remaining separated manure products.

The other very important thing we learned from the research was that the after the manure is separated the coefficient of variation of the nutrient levels in the separated products is one half to one third as variable as manure nutrient levels in agitated pit manure as it is applied. This is a huge finding as it shows how important separation can be when taking manure from large lagoons. In large lagoons it is very difficult to get manure back to a homogeneous state after it has settled out, thus making it difficult to apply the nutrients in efficient manner. Removing the fiber solids from the manure appears to help to improve the ability to agitate the liquids and thus produce manure products which have a more homogenous level of nutrients for field application.

We also developed the BMPs and protocols to efficiently apply separated manure products. A precision steering system is used to guide and record application of manure with a hose drag system. As the manure is being applied, samples are taken every 4 hours. Software is used to link these manure sampling results to site-specific application information to create prescription maps to variably rate apply additional nutrients. We are also evaluating variable rate manure application on fields which have highly variable soil tests. Fields have been grid soil sampled to develop accurate site-specific soil test levels. These maps are then used in combination with yield maps to help develop a nutrient application plan. Manure is applied to crop removal plus to build soil tests in areas of the field where soil tests are below optimum. This technology allows producers to be more efficient in applying their manure, minimizing over/under application, hence improving nutrient use efficiency and soil loss/nutrient loading environmental performance.

Results from these studies have been summarized, published and shared the Midwest Manure Expo at DFRC and at the Professional Nutrient Applicators Association of Wisconsin 2011, 2012, 2013 annual meetings. I have also prepared a presentation which Ted Bay presented at the Nebraska Manure Expo in 2011 and I updated and presented at the 2012 North American Manure Expo in Prairie Du Sac. In 2013, John Panuska and I presented a session on “Spray Irrigation of Nutrients” at the Wisconsin Crop Management Conference in Madison. John then repeated this talk again in 2014.

We have also had extensive meetings with Wisconsin DNR to develop BMPs for irrigating these products. We have been working with emeritus professor John Norman to develop standards for irrigating the clear liquids through waterways in fields. This will be a gigantic step forward if we can get approval to irrigate in season in crop with controlled application of these clearer nitrogen rich manure fluids.

C. Nitrogen Management CIG (2012 to present)

Working with Matt Ruark and Tom Cox we developed and were awarded a Nitrogen Management CIG in which we are studying how we can use new precision ag technologies to improve nitrogen management. In this study we are using new state of the art soil testing and assessment technologies to produce three dimensional soil quality and nutrient information. We can then produce maps on a site specific basis which identify this variability throughout fields. We are trying to set up nitrogen management zones and site specific management pixels in fields so that we can use Precision Ag equipment to fine tune nitrogen rates as we move across the field. From this we will develop a set of BMPs to help farmer understand how to implement variable nitrogen rate technologies.

We are doing this research on manured and commercially fertilized fields with no-till and conservation tillage systems. The research from this project is also being correlated with the field research we are doing in the ARE project described above. The main outcome of this project will be BMPs on how to manage and prescribe variable rate nitrogen applications.

Our current data suggests we may be able to use a combination various soil physical and chemical properties to help us determine how much nitrogen we should apply in each pixel of the field. We know that soils with different textures and water holding capacity definitely respond differently to nitrogen application rates. These soil properties may be some of the keys to helping us establish varying nitrogen rates on fields. We may also need to know how nitrogen stabilizers also impact our varying nitrogen rates and how we can vary rates and stabilizers to improve nitrogen use efficiency, yield and profitability. Again we are early in our research analysis, so we are now testing our new precision ag nitrogen management BMP, and hope to have enough data in the next couple of years to develop variable rate protocols for nitrogen application.

Matt recently presented our first paper at the 2015 Crop Management Conference. We are in the process of analyzing the data and hope to have new recommendations for how to develop variable rate nitrogen recommendations after our data is analyzed and BMPs are developed and tested.

D. *CSREES Pleasant Valley Watershed Project (2008 to present)*

We were awarded this four year CSRESS Grant for the Pleasant Valley Watershed in Dane County in June 2009 and have extended it for another 5 years with other funding sources. This project is a partnership between many agencies to gain a better understanding of how science based BMPs can be used to solve water quality problems in watersheds. The Nature Conservancy (TNC) was also awarded a $600,000 grant from Monsanto for work in this project. The BMPs developed in this project improved conservation on agricultural lands in two ways:
1.) Increased the consistency of how the nutrient models work to help farmers select BMPs and manage nutrients
2.) Implement limited resources to areas of the watershed where we can get the most environmental benefit.

In this project paired watersheds were used to measure how adoption of BMPs affected water quality. Watershed water quality information was matched up with SNAP+ modeling estimates to see how well SNAP+ compared to actual watershed data. A diverse group of stakeholders from the Wisconsin Buffer Initiative collaborated with USGS and UW-Madison scientists for this project. Following a channel stability assessment, a three-tier modeling was used to evaluate SNAP+ runoff, sediment and P loss predictions from edge-of-field to the watershed outlet. Three modeling approaches were tested to find which BMPs had the best impacts on improving water quality.

This research partnership allowed me to share my years of extension farm management experience with people who are concerned about water quality but have limited experience and knowledge on how BMPs affect farmer's decisions and profitability. I played a major part in this part of the research by meeting with producers in the watershed to establish how and why they manage the way they do and shared this information with other partners in the project. This helped farm managers and local/regional conservation compliance agents learn how to identify and evaluate profitable BMP options.

In this research we worked very closely with SNAP+ developers to add economic and soil quality capabilities to SNAP+. This tool is essential to our work as it provides us with the environmental performance information we need to optimize solutions which improve profitability and environmental performance. With Wisconsin DNR and DATCP support, we have developed a batch mode research version of SNAP+ to optimize nutrient management scenarios to improve economic and environmental performance.

Adoption of No-till in the Watershed

I also worked closely with the farms to increase their adoption of no-till farming systems. I planned and taught a no-till field day in June of 2012 and again in 2013. In 2013 I worked to integrate these field days with our agents in Dane, Iowa and Grant counties so as to build a regional awareness of this project and to encourage producers in Southwest Wisconsin to understand the value of no-till in their farming operations. This has led to more no-till education programs with these agents and with agents in other Northwestern counties in Wisconsin which I will discuss a little later.

Producer Videos and Publications

We have developed several videos about farmer's progress and also publications which can be used to demonstrate how we can work with farmers in projects like this one to improve economic and environmental performance. An example of this work is a nice publication we produced with help from NPM titled "Enhancing Farming System Environmental & Economic Performance in the Pleasant Valley Watershed". This publication shows how we can improve environmental and economic performance. Another document titled, "Whole Farm Management to Improve P Indexes" talks about various BMPs that can be used to improve farm profits and environmental performance. In addition to these types of publications I worked with our specialists to develop a Focus on Forage Factsheet titled "Incorporating Grasses into Silages for Dairy Cattle" which helps producers understand how grasses can be added to the ration with favorable milk production responses.

The results of this project continue to reach the popular press. We also were recently featured in a story in the Wisconsin Agriculturist and in the CALS newsletter. These stories do a nice job of showing how we worked with farmers and some of the success of the project. TNC also has a web page with several videos showing how the project.

E. Farm Environmental and Economic Optimization Research and Software Development

Dr. Cox and I are developing optimization modeling software with the Wisconsin Institute for Discovery using farm enterprise cost of production and nutrient/conservation information to optimize farm management and environmental solutions. When this software is completed it will be the first of its kind (nutrient) ration and rotation balancer for fields which will optimize nutrient management and farm profitability. It will also be able to optimizing manure separation and spreading plans for farms. This new software will help us to make significant strides in nutrient management much like we accomplished in ration balancing for dairy cattle rations decades ago.

Costs of production and energy use for each farm enterprise are generated by Financial Enterprise Analysis Tool (FARM), an EXCEL based worksheet I developed. This farm management information linked with SNAP+ runs are then run through optimization software to develop rotations and nutrient management to improve farm profitability and environmental performance. We are also working with Dr. Arriaga and Dr. Ruark to include nitrogen and carbon modeling in our optimization software to assess additional environmental performance factors.

Our models also provide improved estimates of the costs and benefits of conservation and nutrient management. This software has been used extensively to model the impacts of various cropping rotations on farms in southwest Wisconsin. These simulations are used by research scientists like Dr. Laura Ward Good in Soils to evaluate the economic and environmental tradeoffs of the water quality research she and others are conducting in Wisconsin..

We are working with the Wisconsin Discovery Institute to develop manure separation and manure nutrient optimization software which will help to provide optimal solutions for the application of manure separation technologies on farms.

We continue to develop FARM (Financial Enterprise Analysis Tool). FARM is a farm management tool which is used to accurately measure the amount of labor, management, energy, variable and fixed costs used in various enterprises and farming systems. The proper allocation of labor and management associated with capital costs and variable costs allows us to sort out economic differences between farming systems and enterprises. As we move forward with the development of FARM, we are enhancing the enterprise budgets by building in summary tables in each enterprise. FARM data is linked with information from SNAP+ to tie environmental information with economic information to enhance farm profitability and environmental quality.

F. No-Till and Precision Agriculture Education and Research

I continue to write features for the No-Till Farmer magazine and also articles for the No-Till Farmer Conservation Tillage Magazine. This gives us an excellent opportunity to share our knowledge of no-till and precision ag with thousands of farmers across the US who are adopting conservation technologies. As people become aware of our research we are also being asked to share this information at various local and national industry and extension meetings. I spoke at the 2011 and 2013 and 2014 National No-Till Conferences in Cincinnati, Des Moines and Indianapolis where each year over 1000 producers and consultants were in attendance to enhance their skills.

In 2012 I organized a No-till Field day for the Pleasant Valley project with agents in Dane, Iowa, and Green County for producers in SW WI. Nearly 70 producers from SW WI attended the field day. I spoke on setting up no-till equipment and our specialists covered Weed Control and Fertility. This field day then led to us developing an extensive no-till and precision ag educational program for SW WI.

In 2013 I worked with Ted Bay, Gene Schreifert and Heidi Johnson to develop a no-till and precision agriculture field day programs for producers from Dane, Iowa, Grant, and Lafayette counties. We had nearly 70 producers attend this multi-county June field day. Again I spoke on no-till management tips and we had specialists talk about weed control and pest management and about the environmental and economic benefits of no-till.

In June of 2013 I also worked with Greg Andrews to put on a Crop Management and Conservation Field day in Pierce County. At this field day we had about 60 producers. From this field day Greg then developing a no-till users group and we offered our first winter program event for them in January of 2014. Dr. Francisco Arriaga and I developed and gave presentations on no-till management and economics to start off the group. I have included a letter which Greg sent to Dr. Shutske about the value of our work.

MAJOR TEACHING EVENTS	**Date**
Pleasant Valley Watershed Landowner Appreciation/Watershed Project Highlights	12/14
Farm Short Course Farm Management Class/ Precision Ag Opportunities on Your Farm	12/14
NRCS Variable Rate Training/Soil Zone Testing for Precision Ag Systems	09/14
ARE Planning Meeting/Developing Farm Management Analysis of Separation	08/14
Larson Acres Nitrogen Management Meeting/Nitrogen Management Options	07/14
Pleasant Valley No-till Tour/No-till Management	06/14
Manure Agitation Field Day/Floating Manure Agitation Demos	06/14
Mapleleaf Separation Meeting/Economics of Various Separation Equipment	05/14
Pierce County No-till Users Group/Economics and Management of No-till	01/14
National No-Till Conference/Using Precision Ag Technologies in No-till	01/14
Farm Short Course Farm Management Class/ Using Precision Ag on Your Farm	12/13
Variable Rate Technology Field Day/Precision Farming Basics	10/13
Wisconsin DNR Irrigation Meeting/Manure Separation and Irrigation Technologies	09/13
Southwest Wisconsin No-Till Field Day/ Residue: Trash or Treasure	06/13
Pierce Co. Crop Mgmt Field Day/Better Planting Practices & Managing Residue	06/13

MAJOR TEACHING EVENTS (continued)	Date
Variable Rate Lease Webinar/Cropping Budget Comparisons	03/13
Crop Management Conference/Managing Spray Irrigation of Nutrients	01/13
PNAAW Conference/New Manure Separation Technologies	01/13
National No-Till Conference/Improving Performance in Ultra Narrow Rows	01/13
Pleasant Valley Watershed Meeting/Economics of Adopting BMPs	12/12
Farm Credit Lenders Meeting/Optimizing Environmental and Economic Performance	09/12
North American Manure Expo/ Using Precision Ag to Manage Manure	08/12
Pleasant Valley Watershed No-Till Field day/Managing No-Till Equipment	06/12
Evansville Business Leaders Luncheon/Managing Today's Dairy Farms with Technology	06/12
PNAAW Conference/New Technologies and Precision Ag to Manage Manure	01/12
Pleasant Valley Watershed Meeting/Master of Ceremonies	12/11
Farm Short Course Farm Management Class/ Measuring to Manage on Your Farm	12/11
National No-Till Conference/Using Precision Agriculture Systems	01/11
WI PNAAW Conference/New Technologies and Precision Ag to Manage Manure	01/11
Farm Short Course Farm Management Class/ Measuring to Manage on Your Farm	12/10
WWTI Producer Seminar/Managing Equipment in No-Till and Strip-Till	01/10
Agricultural Research Station Winter Conference/Enterprise Budgeting	01/10
National ARS Farm Visit/Manure Separation and Application Research	01/10

II. Examples of Teamwork

Each one of our research projects described above are based on teamwork and collaboration. Our farming systems research projects include scientists from many departments, extension specialists, extension team linkages, and usually include representatives from DNR, DATCP and NRCS. This ensures the farming systems research has perspectives from all disciplines (i.e. soils, agronomy, animal science, ect.) and that the policy makers understand our research and the results of this research. My work is all about teamwork and developing collaborations between our various partners.

III. Contributions to Profession/University

Contributions	Date
Accelerated Renewable Energy Project	2012- present
Conservation Innovation Grant- Nitrogen Management	2012-2015
Conservation Innovation Grant-Manure Separation Technologies	2011-2014
Separated Manure Products Management and Application Team	2009 - present
Pleasant Valley Watershed Team	2008 - present
Biofuels Team	2007 - present
SNAP+ and WBI Research Team	2010 - present
Nutrient Management, Grain and Forage Team Member	2005 - present
Professional Nutrient Applicators Association of Wisconsin	2005 - present

IV. Applied Research and Publications

Research Projects	Date
Accelerated Renewable Energy Project	2012-present
Conservation Innovation Grant- Nitrogen Management	2012-2015
Conservation Innovation Grant-Manure Separation Technologies	2011-2014
Pleasant Valley Water Quality Research	2008-2015
No-Till and Strip-Till Economic Research	2010-2015
Agricultural Research Stations Cost of Production Research	2010-2012
Nutrient/Conservation Farm Optimization Research	2010-2015
Managing Manure with Precision Technologies Grant	2008-2012

Publications	**Date**
Articles for the No-Till Farmer Magazine	2014 - 2010
Environmental and Economic Performance Optimization Software	2014 - 2012
FARM and Optimization Software Development	2014 - 2010
Defining Nitrogen Management Zones with Electrical Conductivity Mapping	2014
Budget Comparison Tool for Evaluating Revenue and Rental Rates	2013
Enhancing Farming System Environmental & Economic Performance in Pleasant Valley	2013
Managing Spray Irrigation of Nutrients Wisconsin Crop Management Conference	2013
Accelerated Renewable Energy Project Grant Application	2012
Whole Farm Management to Improve P Indexes	2012
Nitrogen Management with Precision Ag Conservation Innovation Grant Application	2012
Incorporating Grass into Silages for Dairy Cows – Focus on Forage Vol. 13 No. 2	2011
Conservation Innovation Grant-Manure Separation Technologies	2011
Enhancing Farming System Environmental & Economic Performance	2011
Economics of Strip- Till in the Midwest Extension Bulletin A3883	2010
SNAP+ Simulations for Environmental Performance in Pleasant Valley	2010
Training Materials for WAPNA Level I & II Certification-Co Author	2010
Best Management Practices to Improve Manure Application CIG Grant Application	2010

V. Administrative Responsibilities and/or Research Programs

Programs	**Date**
Agricultural Renewable Energy Project	2013- present
Conservation Innovation Grant-Nitrogen Management	2011-2015
Conservation Innovation Grant-Manure Separation Technologies	2010-2012
Pleasant Valley Watershed Project Extension Partnership	2009-present
Using Precision Agriculture to Manage Manure	2008-2011
No-Till and Strip-Till Economic Research	2008-2015
Agricultural Research Station Economic Analysis Research	2008-2012

VI. Professional Development

One of my largest professional development accomplishments is that I have become a Certified Crop Advisor (CCA). My college training was in Dairy Science and Farm Management, but I have conducted many agronomy research trials. To become a more, well-rounded agriculturist, I worked to learn soil science, pest management and agronomic principles so I could become a Certified Crop Advisor. I also continue to attend programs to build my precision agriculture and farm management skills to be a well-rounded educator and systems researcher.

VII. Future Plans for Professional Improvement

VIII. Additional Awards and Supplemental Materials

A. **Gold Award for General Excellence in Writing 2013 and 2014, No-till Farmer Articles**
Awarded to writers of the No-Till Farmer and Conservation Tillage Publications we wrote by the American Society of Business Press Editors.

B. **Program Innovation Award**
Our Custom Manure Applicator Subcommittee of the Nutrient Management Team received a 2010 Innovative Program Award from our ANRE program leaders for our nutrient management work. Receiving this award as a team member, rather than an individual is special as it shows our professional maturity of working effectively as a team.

C. **2010 Chancellors Award – Custom Manure Applicator Subcommittee**
We received one of the 2010 Chancellors award for our work in "For protecting valuable water resources by effective manure management".

Proposed Five Year Plan for
Professional Development
Jim Leverich, Professor
Department of Ag and Natural Resources
On Farm Research Coordinator, UW-Extension
April 1, 2015

Continued professional development will be needed in nutrient and conservation management, farm management and in the adoption of precision farming technologies. Our research projects are all focused on these areas, and professional development will be needed to ensure that I am on the cutting edge of each of these technologies. I expect that the area were most assistance will be needed is in the area of precision farming. Many new skills will be needed to learn how to utilize and research the use of this blooming technology.

Agronomy and Soil Science
Attend Soil Conservation and Fertilizer Dealer Meetings
Attend Pest Management Update Meetings
Attend Seed Update Meetings
Attend Wisconsin Crop Management Conference
Attend Crop Diagnostics Schools at Arlington
Attend Corn/Soy Expo
Attend National No-Till Conference

Dairy Science and Meat and Animal Science
Attend Department of Dairy Science Update Meetings in Arlington
Attend Lancaster Cow/Calf Days
Attend Grazing Schools and Pasture Walks

Farm Management and Ag Engineering
Attend National Farm Machinery Show and Educational Forums
Attend Farm Management Educational Opportunities
Attend Precision Ag Software Training Opportunities

In addition to attending the workshops listed above, I will also continue to read and study new information in these areas. From time to time, I will also set up individual or group meetings with specialists, researchers, and agency and industry representatives to learn more information on particular topics.