2013 Strategic Plan – A Guide for Our Future

West Central Research and Outreach Center
University of Minnesota
April, 2013
Foreword

The West Central Experiment Station, forerunner of the West Central Research and Outreach Center (WCROC), was established in 1910. For over 100 years, this institution has been conducting research and education around agricultural practices. The WCROC and its predecessor have played and will continue to play an integral part in the research and education missions of the University of Minnesota’s College of Food, Agricultural and Natural Resource Sciences (CFANS). We hope that the WCROC will earn an ever larger role in helping the College develop and implement agricultural technology into the future. However, to realize this hope, we must occasionally pause to consider our assets, our weaknesses, and the realities of the world around us. And, use this information to formulate possibilities for the future. These reflections and deliberations help us chart a path for our work into the future. In other words, develop a strategic plan.

This document represents the first strategic plan developed for the WCROC in over 25 years. This plan is the collective work of the faculty and project leaders at WCROC in collaboration with the WCROC Advisory Committee. The plan charts small and large steps we would like to take to advance our mission. As you read the plan, please consider how you can help us, in large or small ways, to achieve the goals set out in this plan. I encourage you to share your thoughts, ideas, suggestions, and critiques with any of the people involved in developing this plan.

Thank you for your interest in the West Central Research and Outreach Center!

Lee J. Johnston
Director of Operations
April, 2013

Methodology

Faculty and project leaders at the West Central Research and Outreach Center determined that the Center needed a plan to help guide investments of human and financial capital in ways that would benefit the Center’s stakeholders and the Center. Our first step was to update the mission statement for the Center. Project leaders and faculty worked cooperatively to develop and embrace a new mission statement which appears below. This revised mission statement set the boundaries for our planning activities.

Our next step was to secure the help of Ms. Sue Haglin (Insight Training, Alexandria, MN) to guide us through the process of collecting input, sifting through that input, focusing on the important and realistic questions, and developing this report. In July 2012, we held two meetings with stakeholders to learn their views of the Center’s strengths and weaknesses. We also asked them for guidance on future directions for activities at the Center. These meetings were attended by 25 people representing a broad cross-section of agricultural interests.
In October 2012, we held a two-day meeting which included the WCROC Advisory Committee, WCROC project leaders, and WCROC faculty. During the first day of this meeting, participants shared their ideas on the strengths and weaknesses of the Center and they offered ideas on the future directions of the Center. At the second day of the meeting, participants sorted through all the ideas collected on the previous day and at the stakeholder meetings to distill them into workable action plans. The goal was to establish a focused, short action plan for each discipline area (Crops research, Dairy, Horticulture, Renewable Energy, Swine) at the Center. In addition, we identified some strategic needs that spanned all disciplines at the Center. So, we developed a one-page action plan to address needs in Capital Planning and Communications. Since October 2012, project leaders and faculty have been fine-tuning their one-page plans and beginning to implement these plans.

Our goal was to establish a concise, realistic plan that maps out strategy for activities and investments at WCROC for the foreseeable future. This plan is malleable and a “work in progress”. Some portions of the plan are still being developed because they are built on other portions of the plan.

People involved in developing this plan

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<tr>
<th>WCROC Staff</th>
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<tr>
<td>Dr. Brad Heins, Dairy Scientist</td>
<td>Mr. Glen Borgerding, Organic crop consultant</td>
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<td>Dr. Lee Johnston, Swine Scientist</td>
<td>Mr. Dennis Gibson, Forage crop producer</td>
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<td>Dr. Yuzhi Li, Swine Scientist</td>
<td>Mr. Jeff Hellerman, NRCS Conservationist</td>
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<td>Mr. George Nelson, Plot Research Scientist</td>
<td>Mr. Brian Kruize, Morris Coop Manager</td>
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<td>Mr. Steve Poppe, Horticultural Scientist</td>
<td>Mr. Dean Meichsner, Ag. Loan Officer</td>
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<tr>
<td>Mr. Curt Reese, Water Quality/IT specialist</td>
<td>Mr. Robert Neal, Vineyard owner/operator</td>
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<td>Mr. Mike Reese, Renewable Energy Coordinator</td>
<td>Mr. Bob Schmitt, Seed dealer/Agronomist</td>
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<td>Dr. Joel Tallaksen, Biomass Project Coordinator</td>
<td>Mr. Tim Swedberg, Nursery owner/operator</td>
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<td>Ms. Terry VanDerPol, Beef producer</td>
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<td>Ms. Suzanne Vold, Dairy producer</td>
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Facilitator: Ms. Sue Haglin, Insight Training
WCROC Strategic Plan: Across Disciplines

MISSION

WCROC provides research-based innovation and outreach by vigorously pursuing opportunities for agricultural producers and rural citizens while identifying and responding to emerging trends, developing dynamic solutions, and offering active learning experiences.

5-YEAR STRATEGIES

- Create and implement a fund development plan to enhance all WCROC programs that includes base, grant, and private funding.
- Develop and implement a 5-year capital plan to update and remodel our current facilities and establish new facilities.
- Develop and implement a plan to modernize outreach activities and learning experiences.
- Add three new faculty positions: agronomy, renewable energy, horticulture.
- Identify permanent funding for student internships.
- Add a communications/media position.
- Create and implement a robust communications plan that includes the following aspects: Website, social media, audience segmentation, marketing, and metrics.

2013 - 2014 PRIORITIES / BOLD STEPS

- Create a fund development plan to enhance all WCROC programs. (Lee, Steve)
- Develop a 5-year capital plan for our facilities updates/remodeling. (Mike, Curt)
- Begin renovation on the maintenance shop to modern building codes. (Curt)
- Identify a purpose for sheep barn. (Lee)
- Develop a plan to modernize outreach activities and learning experiences. (Joel, Brad, Tim)
- Research the technical aspects and requirements of developing a dynamic website. (Joel)
- Add one new faculty position in 2013. (Lee)
- Identify internship funding sources. (Lee)
- Identify funding sources for the communications/media position. (Lee)
- Conduct a communications audit, evaluating what we have and how effective current communications are. (Mike)
- Achieve our 2013 Program Plans. (All Program Leaders)
WCROC STRATEGIC PLAN: Capital Assets

WCROC 2020 CAMPUS MASTER PLAN – DEVELOPING THE 21ST CENTURY AGRICULTURAL EXPERIMENT STATION

Overall Champion: Lee Johnston

The primary goals of the Capital Plan is to provide and maintain capital assets required to meet the mission and strategic objectives of the West Central Research and Outreach Center and to provide the region, state, and nation with valued, leading-edge agricultural and rural research and education. A secondary goal is to continue being a regional resource for citizens of Greater Minnesota.

TWO YEAR FOCUS

In 2013 through 2014, a WCROC Campus Master Plan will be developed. The WCROC Campus Master Plan including a Six-Year Capital Plan will be submitted to the University for approval. From the Six-Year Plan, an Annual Capital Request will be made to the University to support one major capital project through a legislative request. Additional capital asset upgrades including new construction, remodel, repair and maintenance, and asset acquisition will be made through internal and sponsored funding.

STRATEGIC PLAN ➔ CAMPUS MASTER PLAN ➔ 6-YR CAPITAL PLAN ➔ ANNUAL CAPITAL REQUEST

KEY MEASUREMENTS/OBJECTIVES – 2013 through 2014

- A WCROC Campus Master Plan including a six-year capital request will be developed.
- Approval of the WCROC Campus Master Plan will be requested from the College and University.
- An Annual Capital Request will be submitted to the college and University administration.
- $1 million of external funding will be developed as a match for the Annual Capital Request.
- The Annual Capital Request including the external funding match (item 4) will total over $4 million.
- The first two phases of the Farm Shop Remodeling Project will be fully funded and completed.

KEY STRATEGIES and ACTION STEPS – 2013 through 2014

- A WCROC campus planning charrette will be held with program leaders, Director, and the ROC Head.
By January 2014, the Advisory Council, CFANS Deans’ Council, and CPPM will review and provide feedback on the WCROC Campus Master Plan and the Six-Year Capital Plan drafts.

A completed WCROC Campus Master Plan will be submitted to CFANS, CPPM, and the University Regents for approval by July 2014.

As part of the Master Plan, two major capital requests will be developed including:
  o Midwest Organic Dairy Production Research and Education Complex
  o Horticulture Research and Display Garden Pavilion

Farm Shop Remodel project designs will be completed and approved by April 2013 and construction will begin by July 2013.

The Master Plan will include a prioritized list of maintenance and repair projects. The top 10 projects will be completed by December 2014.
ADDENDUM TO CAPITAL ASSETS PLAN: OPTIONS FOR MAJOR CAPITAL REQUESTS

Option 1: Midwest Organic Dairy Research and Education Complex

The West Central Research and Outreach Center (WCROC) has a strong tradition of research and outreach that has provided the dairy industry numerous advancements that contribute to efficient food production in the United States. Dairy research began in 1915 with Holstein and Guernsey cattle, and the dairy herd provided outreach for farmers in west central Minnesota. Currently, the 200-cow dairy is the only certified organic dairy at a land grant institution in the Midwest and this provides an important source of insight for conventional and organic dairy producers. The decision to transition a portion of the dairy herd and supporting land at WCROC to the organic production system provides an opportunity to set new directions in research and extension. The WCROC dairy program has the only side-by-side comparison of organic and conventional systems in the United States.

The goal of the dairy program at the WCROC is to serve the research-based information needs of the moderate sized dairy farm, with emphasis on reduced input systems. The current dairy facilities were completed in 1972, and the aging research facilities for dairy cattle are inadequate to address the future research and educational needs of the dairy industry. Therefore, long-term investment in dairy research facilities is important to the sustainability of the dairy industry in the Upper Midwest. These facilities must address issues related to efficient use of energy, animal care and well-being, and approaches to minimize impacts of dairy production on the environment and the carbon footprint. The WCROC dairy program is ideally positioned to address critical agricultural issues. This project has an advantage due to the active farmers and non-governmental organizations supporting the WCROC dairy efforts.

The University’s MnDrive (Minnesota Discovery, Research and InnoVation Economy) initiative includes a focus on food systems and robotics. The organic dairy research complex will include a milking parlor expansion and new robotic milking systems to meet the demand of this emerging technology in the dairy industry. We will also expand the use of small-scale renewable energy and energy efficient technologies to the dairy and corresponding feed facilities. The WCROC perhaps provides the only location in the world with such a combination of novel renewable energy systems in agricultural production settings. Further development of the facility would be combined with the University of Minnesota-Morris efforts to link food, healthcare, and education, by incorporating a small on-farm processing facility for research and education. The WCROC dairy operation provides an ideal testing opportunity to evaluate and demonstrate the effect of small-scale processing facilities that will assist consumers with purchasing decisions. These new capabilities will greatly enhance our ability to provide cutting-edge educational opportunities for agricultural producers and rural citizens.
There are many funding models that could build and upgrade the facility as low-cost and efficiently as possible. The dairy industry in Minnesota is very supportive of the research and extension at the WCROC, and therefore, will be considered as a potential funding partner.

*Desired Features of the Dairy Complex:*

1. Milking parlor expansion and upgrade
2. Robotic milking system with data capture
3. A new compost barn to house cattle in the winter
4. Upgrade conventional feed mill and include a dedicated organic feed mill and feed storage and re-designed grain storage areas for organic grains. This facility must be connected to the grain dryer system and insure segregation of organic grains.
5. Extend and concrete silage pad, resurface asphalt next to silage pad, chip seal asphalt on east side of farm
6. Buy additional land for crops and livestock
7. Expand the use of small-scale renewable energy and energy efficient technologies to the dairy and feed facilities.
   a. Install a small-scale wind turbine and solar PV for the dairy
   b. Install a solar thermal system for the dairy (already in progress)
   c. Instrument facilities to collect load data and to automate controls
   d. Incorporate thermal and electrical energy storage systems
   e. Re-purpose a current building (old plot building or sheep building) to serve as a thermal and electrical energy storage lab for renewable systems associated with the dairy complex.
   f. Convert fossil-based fuel systems to electric; for example, the high pressure washer
8. Install integrated backup energy generation system based on renewable sources.
9. Install organic dairy interpretive kiosks with touch screen computers near the Overlook and east side of garden.
10. IT
   a. Supervised Control and Data Acquisition / Storage System
   b. Install fiber lines to research buildings
   c. Telephone system upgrade
   d. Data server
11. Repair kitchen/floor/floor coverings – refurbish guest house for student interns, visiting scientists, and U of M researchers visiting WCROC.
12. Enable fuel dispensing of hydrogen and ammonia as a fuel for tractors, trucks, generators, and other farm vehicles
Option 2: Horticulture Research and Display Garden Pavilion

The construction of a Garden Pavilion on the west end of the current WCROC Horticulture Display Garden would create new opportunities for outreach and education in the Garden and for the WCROC. Numerous activities currently held in the Garden lack adequate resources, space and shelter. Since there are no other venues like the proposed Pavilion in the region, we anticipate it would be used for educational events and activities, family and community gatherings, a site for weddings and receptions, and a venue for music, arts and cultural performances. A Pavilion would enhance our current events (such as Horticulture Night, Dinner in the Garden, and our monthly “Come Grow with Us” education series) as well as expand our options for adding new programs and activities that are not feasible with our existing facilities. The Pavilion would include both indoor and outdoor seating accommodations for approximately 125 guests, along with indoor restrooms, and a serving area. The Pavilion would be available for educational purposes, which includes a counter space for displays and demonstrations, as well as a wall designated for Power Point presentations. While keeping within the Prairie School of Architecture and complimenting the existing structure of the Pomme de Terre Overlook, the Pavilion should offer a sense of openness that allows visitors to enjoy the beauty of the Garden.

A Garden Pavilion Fund has already been established through the U of MN Foundation. Long-term garden donors have contributed to the initial stages of this project. The WCROC Horticulture Staff, in consultation with the WCROC Horticulture Advisory Committee, have identified possible concepts and ideas to incorporate into the Pavilion. Discussions are underway with the Capital Planning staff from the University to begin development of a pre-design document which will guide construction and financing of the Pavilion.

Desired Features of the Garden Pavilion, Horticulture Display Garden, and the surrounding grounds:

1. Garden Pavilion to include indoor and outdoor seating accommodations for approximately 125 guests.
2. The Pavilion would also include a serving area complete with counter space for educational displays and demonstrations, indoor restrooms, and serving area.
3. Restrooms at the east end of the Garden, near the Children’s Garden area. Many events and activities are held at the east end of the Garden; numerous visitors, class attendees, children and volunteers visit the Garden everyday throughout the growing season and would benefit from a permanent restroom facility.
4. Make the Garden more handicapped and limited mobility accessible by installing hard surfaced paths, raised beds, and handicap accessible and ADA compliant ramp.
5. Install automated irrigation in key Garden areas.
6. New greenhouse growing space and updating of existing greenhouse and storage facilities.
7. Two interpretive kiosks with touch screen computers, one at the east end and the other at the west end, would allow visitors to learn more about what it in the Garden as well as the other research and projects conducted at the WCROC.

8. Develop the concept of the Market Garden on the southeast end of the Garden. With an increase in demand for fresh local produce, and the need for education on how to grow healthy foods, creating a Market Garden offers a way for us to demonstrate how to grow produce. The Market Garden is part of the Master Plan, and would likely involve groups such as Morris Healthy Eating Initiative, UMM Garden Club and the area schools.

9. Interpretive signage at all key areas on the WCROC grounds. This will help to integrate the Garden with the rest of the farm, giving visitors a more seamless transition from one area to another.

10. Provide lighting in key Garden areas and parking lots. With present and future activities taking place later in the day, having adequate lighting is an important safety feature.

11. Permanent shelter for registration at horticulture educational events.

12. Restore current pond west of swine nursery. As this area gets closer to the Pomme de Terre Overlook restored native prairie, we need to make this area aesthetically pleasing.

13. IT
   a. Supervised Control and Data Acquisition/Storage System
   b. Install fiber lines
   c. Telephone system upgrade
   d. Data server


15. Expand current parking lot.

16. Expand and resurface current parking lot

17. Repair kitchen/floor/floor coverings – refurbish guest house for student interns, visiting scientists, and U of M researchers visiting WCROC
WCROC Program Plan

Program Plan for: Web Communications
Overall Champion: Joel Tallaksen

ONE YEAR FOCUS

- Examine the full potential for web-based content that we could consider
  - Potential Audiences
  - Information to Convey
  - Format for Outreach

- Identify which areas of web communication we want to enhance
  - Determine level of faculty involvement
  - Determine where technical help will be needed

- Identify resources needed to get us to our desired website

- Begin easy changes

- Start planning technologies and staffing to get to desired website.

KEY MEASUREMENTS/OBJECTIVES

- Have a written plan for where we are headed.
  - Have every program identify what they expect from the site.
  - Have the center as a whole identify its needs

- Begin soliciting actual content changes.

- Make decisions on staffing

KEY STRATEGIES and ACTION STEPS

- Joel will work on information for faculty that will help them evaluate their program needs and the needs of the station.

- Joel will work with CFANS to locate resources and find limitations of a website that represents our unique situation.

  Lee and others will identify staffing resources that can help us achieve the actual work of making a website happened.
WCROC Program Plan

Program Plan for: Plot Research
Overall Champion: George Nelson

TWO YEAR FOCUS
- In 2013 and 2014, the crops program will focus on weed management and crop productivity in a 6-year reduced tillage organic rotational cropping system that utilizes manure as its nutrient source. This system will be contrasted with a 6-year aggressive tillage organic rotational cropping system. In 2014 we will examine tile line nitrate movement associated with these cropping system.

KEY MEASUREMENTS/OBJECTIVES
- Measure differences in grain and forage yields associated with reduced tillage and aggressive tillage organic cropping systems in 2013 and 14.
- Measure differences in weed pressure associated with reduced tillage and aggressive tillage organic cropping systems in 2013 and 14.
- Measure differences in tile line nitrate concentration associated with reduced tillage and aggressive tillage organic cropping systems late in 2014.

KEY STRATEGIES and ACTION STEPS
- A 6-year rotation encompassing both cropping systems will be initiated each year for 3 years (2012, 2013, 2014). The cropping systems will require refinement and procedural change as time progresses, due to climate and pest variability. The ultimate goal is to evaluate if productivity can be maintained using mostly crop competition verses mostly tillage for organic weed management.
  - Establish protocols for field- scale grain and forage yield determination in spring 2013.
  - Establish a fixed transect in crop system fields for weed monitoring in spring 2013.
  - Install instrumentation in nitrate sampling wells in spring 2013.

Outcomes
- Data collection of energy requirements and productivity of energy-optimized cropping systems will be included in the Greening Agricultural Energy IREE Grant deliverables.
- Evaluation of organic cropping systems and associated agronomics will be presented at Summer Field Day 2014.
- Summer Field Days will include both Ag Industry and crop research talks.
WCROC Program Plan

Program Plan for: Dairy
Overall Champion: Brad Heins with assistance from many other faculty from St. Paul campus and Extension

TWO YEAR FOCUS

- The focus for the dairy program is solidified for the next 4 years because of a 4-year $1.9 million USDA-OREI grant. The research will focus on the organic milking cows, with a few small calf studies. Depending on grant funding, the research in 2014 may expand to organic and conventional heifers. We may analyze the health data from the crossbreeding program provided we find a student to complete the research. In 2014, the research focus will also include on-farm research. Extension efforts will include many field days, workshops, and online presentations and articles.

KEY MEASUREMENTS/OBJECTIVES

- We will publish 4 articles from the research completed at WCROC during 2013.
- Graduate student progress will be made on the organic research topics and successful master’s completion in early 2015.
- We will continue the WCROC Organic dairy day program during the summer of 2013 and 2014. We will also host organic field days on organic dairy farms.
- I will continue to apply for grants for organic and conventional dairy funding beyond 2014, and calf and heifer research will be topics for funding.
- For the dairy program, I would like to increase the productivity and efficiency of the 2 dairy herds by 5 to 10 lbs/cow/day. I will also continue to efficiently manage the dairy unit and we hope to not buy any feed (hay or corn) during 2013 and 2014.

KEY STRATEGIES and ACTION STEPS

- Develop an effective extension and outreach plan for the Organic dairy program that includes an extensive update on the WCROC website.
- Begin the OREI funded research project and will train graduate students in alternative dairy production systems.
- Effectively manage the OREI project and continue collaborations between WCROC and St. Paul campus faculty and USDA soils lab scientists.
WCROC Program Plan

Program Plan for: Horticulture
Overall Champion: Steve Poppe with assistance from Esther Jorday and Horticulture Advisory Committee

TWO YEAR FOCUS

- Fine tune our educational offerings with a focus on youth and young adults. Increase and expand the audience.
- Develop and recommend future plans for the Horticulture Display Garden in the areas of research, staff succession, and Fund Development.
- Expand the level of involvement from volunteers, Master Gardeners and young adults.
- Move forward with small fruit research in coordination with local foods initiative.

KEY MEASUREMENTS/OBJECTIVES

- Increase the number of donor contributions, both to the General Fund and to elements of the updated Master Plan.
- Successfully apply for and receive grant funding for small fruit research.
- Increase the number of younger volunteers.
- Offer education classes 10 months out of the year. Review evaluations for ideas on upcoming topics.
- Have increased involvement from the local Master Gardeners.
- Offer more educational interpretation within the Garden.
- Have a plan for a Market Garden ready to present to collaborators for planting season of 2014.

KEY STRATEGIES and ACTION STEPS

- Add new members to the Horticulture Advisory Committee. Horticulture Advisory sub-committee has developed appropriate list.
- Assign the task of brainstorming ways to attract more volunteers with age and job diversification to the Volunteer Sub-committee.
- Share the updated Horticulture Garden Master Plan with interested citizens.
- Review, prioritize and implement Marketing plan from HBH Consultants.
- Have the Education Sub-committee meet to come up with a proposal for ideas and use of a Market Garden.
- Meet with key figures within children’s education arenas to brainstorm ideas for increasing youth involvement.
- Develop and recommend a staffing and succession plan. Recommendations from Horticulture Advisory Committee, Emily Hoover, Lee Johnston and Greg Cuomo.
- Identify decision making guidelines for prioritizing research opportunities. Consultation with Department of Horticultural Science.
- Create a plan for improved interpretation in the Garden.
WCROC Program Plan

Program Plan for: Renewable Energy
Overall Champion: Michael Reese

The primary goal of the program will be to increase utilization of renewable energy in production agriculture and support the further development of agriculture-based renewable energy for the region, state, and nation through research and outreach. The agricultural industry’s consumption of fossil-fuel carries significant economic, environmental, and ecological risks. The renewable energy program will work to mitigate these risks and exploit opportunities.

**TWO YEAR FOCUS**

- In 2013 through 2014, the Renewable Energy Program will strive to “green” energy consumed in agricultural production systems and in rural communities through development of renewable and efficient energy technologies. Improvements in these technologies will contribute towards increased farm profitability and stability, thriving rural economies with growing manufacturing and value-added businesses, decreased environmental and ecological impact, and ultimately more jobs and wealth created in Greater Minnesota.

**KEY MEASUREMENTS/OBJECTIVES – 2013 through 2014**

- Instrument the WCROC dairy facility and measure energy consumption from each load source.
- Design an energy-optimized dairy facility and complete installation.
- Begin a baseline evaluation of swine facility energy consumption and install instruments to measure loads and to test more energy efficient HVAC control protocols.
- Collect energy consumption data from the crop and feed operations at WCROC and identify energy upgrades that will lower fossil fuel consumption.
- Host a national Agricultural Energy and Renewable Fertilizer Conference with at least 130 participants.
- Host a renewable energy bus tour in west central Minnesota with at least 50 participants.
- Update the renewable energy web-site within the first 10 days of each Quarter (every 3 months).
- Publish at least two papers and present papers or posters at a minimum of 3 conferences in each year.
- The Renewable Hydrogen and Ammonia Pilot Plant will be fully operational and produce ammonia fertilizer in 2013.
- The following sponsored projects will be completed and reports submitted:
  - MN Corn - Reese / Ruan Project
  - MN Corn – Reese / Tiffany Project
Secure a renewable energy faculty position to be located at the WCROC.

5-YEAR OBJECTIVES

- Assess the energy consumption of agricultural production systems across the WCROC by measuring energy inputs within dairy, swine, feed, and crop operations.
- Conduct Life Cycle Assessments of current and optimized energy systems.
- Incorporate energy-optimized systems within areas of WCROC agricultural production including:
  - Development of locally-produced fertilizers with low carbon footprint
  - Dynamic storage of renewable energy
  - Installation of energy efficient heating, cooling, ventilation, drying, and pumping / compression systems
  - Alternative fueled or electric tractors, trucks, combines, and farm service vehicles
  - Reduced pass and no-till cropping systems and other methods to reduce fuel consumption in crop production
- Develop value-added renewable energy and bio-based products that can lead to expanded business opportunities in Greater Minnesota.
- Broaden opportunities to evaluate innovative renewable energy systems by collecting data on farms, businesses, homes, and public facilities.
- Maintain an up-to-date website and develop effective and efficient mechanisms to transfer information to agricultural producers and rural citizens.
- Streamline data acquisition and analysis.

KEY STRATEGIES and ACTION STEPS – 2013 through 2014

- Secure funding from IREE, Xcel RDF, State of MN, federal government, and commodity and other non-government organizations to: audit energy consumption in WCROC agricultural production systems, design and install energy-optimized systems, and conduct life cycle assessments. (Mike / Joel)
- Install meters and other data acquisition components in the dairy facility (Eric)
- Meet with renewable energy staff on a bi-weekly basis to plan the Agricultural Energy and Renewable Fertilizer Conference and Tour (Mike).
- Post updates onto the renewable energy web page each quarter (Eric)
- Complete commissioning of the ammonia skid (Cory and Eric)
- Complete a research paper or poster in each quarter of the year (Joel).
- Finalize sponsored research reports and submit a week prior to each deadline. (Mike and Joel)
- Receive final approval for a renewable energy faculty position, advertize, interview, and hire (Mike)
WCROC Program Plan

Program Plan for: Swine
Overall Champion: Lee Johnston/Yuzhi Li

Lee Johnston will oversee the implement of this plan. Yuzhi Li will lead to complete the plan by Dec 31st, 2014.

**TWO YEAR FOCUS (2013-2014)**

The swine program will continue to focus on swine nutrition and well-being. Although specific research projects will be dictated by the availability of funding, they will be in the following areas:

- Effectively and efficiently use natural resources to produce safe pork. We will investigate alternative feed ingredients such as ethanol by-products (DDGS) and cotton seed oil that can reduce feed cost and maintain pork quality.
- Improve swine welfare while maintaining productivity and efficiency: Sow housing, castration, and compromised pigs are animal welfare issues that challenge the swine industry. We will strive to find solutions to these issues by application of immunocastration, reducing slow growing pigs, and minimizing aggression in group-housed sows.
- Identify strategies to improve production efficiency of alternative swine production: A challenge to alternative swine production is low productivity and poor efficiency. We will identify the key factors affecting production efficiency by documenting and analyzing production record at the WCROC.
- Contribute to graduate and undergraduate education, with emphasizing experiential learning.

**KEY MEASUREMENTS/OBJECTIVES (2013-2014)**

The success of the program will be measured by grants, publications, graduate/undergraduate student education, and extension/public engagement. Specifically, the achievable objectives will be:

- Developing 5 grant applications for the federal, state and commodity agencies.
- Disseminating research to broad audiences through publications in peer-reviewed journals (4 articles each year), magazines, newsletters, and websites.
- Organizing one workshop and one field day for both alternative and beginning farmers each year.
- Advising four graduate students, interns, summer students and/or visiting scholars each year.
- Offering the first experiential learning course to undergraduate students.

**KEY STRATEGIES and ACTION STEPS (2013-2014)**

- To obtain grants to support our research, we will target the following funding agencies: USDA, National Pork Board, Minnesota Pork Board, Corn Growers, and
other commodity groups. Strategies will include: targeting on hot issues (such as high feed cost and animal welfare), utilization of research facilities at the WCROC (the complete alternative housing system), collaborating with faculty on St Paul campus, as well as in other institutes (such as South Dakota State University and Washington State University) and other countries (such as Canada, Australia, and China).

- The research projects will be dictated by funding availability. During the years of 2013 and 2014, two research projects for graduate programs will be conducted: 1. Strategies to mitigate soft carcass fat in pigs fed DDGS, and 2. Causes and Solutions to Slow Growing Pigs. In addition, a preliminary study will be conducted to investigate automation of measuring aggression among sows, with the goal of obtaining a larger grant for gestating sow housing. The group-gestation housing project will focus on improving well-being of low ranking sows through pen design (infrastructure improvement may be needed for the project). Besides the projects conducted at the WCROC, a project of group-housed sows will be conducted through collaborations with scientists at the Prairie Swine Center in Canada.

- We will continue to serve pork producers and the swine industry through extension/outreach efforts. We will integrate the newly hired Swine Extension Educator into our extension/outreach program. In 2013 and 2014, we will organize workshops and field days for small scale and beginning farmers, with emphasis on health monitoring, environmental management, nutrition, and breeding of pigs. We will demonstrate alternative swine production through field days. To investigate production efficiency and profitability, we will document cost and return of alternative swine production at the WCROC.

- We will maintain a minimum number of 4 summer students, interns, graduate students, and/or visiting scholars supervised, depending on funding availability. In 2013 and 2014, we will collaborate with UMM faculty to launch a new Experiential Learning course for undergraduate students.