

The Minnesota Agriculture, Food, and Natural Resource Education Blueprint



Prepared by the
Minnesota Agricultural Education
Leadership Council (MAELC)
February, 2012

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Executive Summary

From the summer of 2010 to early 2012, The Minnesota Agricultural Education Leadership Council (MAELC) coordinated an effort to inform the Minnesota State Legislature about the current status of the agriculture, food, and natural resource education (AFNRE) system in Minnesota, to describe a vision for AFNRE, and identify the actions to achieve that vision. The AFNRE Blueprint is the product of that effort, representing the views of a wide cross-section of Minnesotans who have a stake in a high quality and robust AFNRE system that supports informed food, nutrition, and natural resource use decision-making and a strong AFNR workforce. The Blueprint represents an ambitious and successful outreach effort that has fostered open communication and effective collaboration among the diverse constituencies involved in AFNRE to establish a common understanding and vision for AFNRE and identify a strategy for achieving that vision over the next five years.

Vision

The Blueprint is based on the vision that AFNRE provides lifelong learning in agriculture, food, and natural resources. This overall vision for AFNRE includes the following vision statements for agricultural literacy, secondary education, two-year college programs, Farm Business Management, and baccalaureate and above programs, which make up the five AFNRE sectors included in the Blueprint:

- Agricultural literacy efforts ensure all people understand and value AFNR systems
- Secondary education provides access to AFNRE and career exploration for all Minnesota students
- Two-year college AFNR programs meet the needs of learners, industry, and the world
- Farm Business Management programs build farm business success, one informed decision at a time
- Baccalaureate and above education develops competitive and dynamic agricultural educators, communicators, and leaders

Bold Steps

The vision for AFNRE may be achieved over the 2012-2017 period by:

- Developing a curriculum map for agricultural literacy that is cross-referenced with common core academic standards
- Creating innovative AFNRE program models that can be implemented in all secondary schools
- Meeting the unfulfilled need in AFNR industries by creating awareness of current and future career opportunities through two-year college programs
- Developing a fiscally sound Farm Business Management program with a common vision and mission among all stakeholders
- Aggressively identifying, recruiting, and retaining an increased number of diverse Agriculture Education teacher candidates

Next Steps

MAELC intends to disseminate the Blueprint widely throughout Minnesota to engage interested parties in discussion of recommended strategies for implementing it. MAELC will encourage existing and new partners to guide state and local policy that supports a robust and responsive AFNRE system for all Minnesotans.

AFNRE Blueprint Background

MAELC initiated a project to explore the future of AFNRE in Minnesota in 2010. The AFNRE Blueprint described in this report is the result of the dedicated work of the Core Planning Team, education experts, working group members, and interested Minnesota citizens who generously contributed to its development. MAELC initiated this project in response to its charge to make recommendations to the state legislature to guide the development of AFNRE programs in Minnesota.

The AFNRE Blueprint provides a common understanding of the complex and interrelated nature of AFNRE and is a launching point for efforts to support the growth and development of AFNRE in Minnesota over the five year period from 2012 to 2017. The AFNRE and sector blueprints provide a brief profile of each sector and the vision and *Bold Steps* that emerged from listening to a broad cross-section of stakeholders and the work of AFNRE working groups and Core Planning Team. The initial Blueprint is intended to guide the development of AFNRE as it prepares Minnesotans for the continued strong demand for careers in AFNR (Appendix A) and to support informed food, nutrition, and natural resource related decision-making on the part of all Minnesotans. Blueprint developers anticipate that the blueprints will change over time in response to the changing needs and goals of the people of Minnesota and the AFNR system.

The Development Process

The Blueprint reflects the views of over 350 people who participated in eight Listening Sessions throughout Minnesota during the summer of 2010. Later the same year, over 200 people attended an AFNRE Summit in Bloomington, MN to review the results of Listening Sessions and determine the next steps in visioning the future of AFNRE. Based on feedback from Summit participants, MAELC passed Resolution 2011-01 (Appendix B) in June, 2011 to develop five working groups responsible for creating the AFNRE Blueprint, which would guide policy and funding recommendations for the Minnesota State Legislature and other stakeholders.

A Core Planning Team was involved in planning and facilitating the AFNRE Blueprint development process from its inception. The planning team members are Julie Tesch, MAELC Executive Director; Sarah Dornink, MAELC Community Program Assistant; James Leising, Ph.D. and Brad Greiman, Ph.D., University of Minnesota-Twin Cities Agriculture Education faculty; Richard Joerger, Ph.D., MNSCU System Director for Agriculture and Business Program Coordination; and Joel Larsen, Minnesota Department of Education Program Specialist for Agricultural Education. A list of the names and affiliations of all individuals who contributed to the creation of the AFNRE Blueprint is included in Appendix C. The timeline for developing the AFNRE Blueprint is illustrated in Table 1.

Table 1. *AFNRE Blueprint Development Timeline by Year and Quarter*

AFNRE Blueprint Development Milestones	2010				2011				2012
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Listening Sessions		X							
<i>Connecting Summit</i>				X					
MAELC Board Resolution						X			
Working Groups: Strengths, Problems, Opportunities, Threats								X	
Working Groups: Vision and <i>Bold Steps</i>								X	X
Core Planning Team Input and Feedback		X	X	X	X	X	X	X	X
Combined Working Groups: Vision and Priority <i>Bold Steps</i>									X
Blueprint Development									X
Dissemination at FFA Day at the Capitol									X

Listening Sessions

In the summer of 2010, MAELC sponsored eight Listening Sessions in Crookston, Grand Rapids, Mankato, Minneapolis, Rochester, Willmar, Worthington, and Vadnais Heights. Invited experts and interested stakeholders representing a diverse group of AFNRE stakeholders included K-12 teachers and administrators and representatives of higher education, government, and industry.

Facilitators led discussions of the role and impact of AFNRE in 1) creating a healthy economy, 2) preparing the workforce for careers in AFNR, 3) building awareness of food, agriculture, and the environment and 4) having a positive impact on students. Appendix D contains the Listening Session discussion questions. The following four overarching priorities for the future of AFNRE emerged from the Listening Sessions:

- Current and emerging audiences in both rural and urban settings must be engaged and societal, technological, and educational trends should inform and direct programs
- AFNRE should create greater awareness of the many career and educational opportunities in agriculture, food, and natural resources
- Educators must partner with community organizations, schools and universities, businesses, and non-profit organizations to provide lifelong learning opportunities
- Both quantitative and qualitative indicators of success in educational programs must be developed since education is the umbrella that connects growth opportunities in agriculture, food, and natural resources

These findings served as the launching point for discussions of the desired future for AFNRE at the December 2010 Summit.

The Connecting Summit

Approximately 200 people who attended previous Listening Sessions and other interested parties attended the *Connecting the Growth Opportunities in Agriculture, Food, and Natural Resources Summit* in Bloomington, MN on December 13, 2010. The summit program, speaker biographies, and final report are available online at <http://www.2010summit.umn.edu>.

The first half of the summit consisted of a panel discussion around the future of AFNRE. Panelists included:

- Allen Levine, Dean, College of Food, Agricultural and Natural Resource Sciences, University of Minnesota
- Scott Olson, Interim Senior Vice Chancellor, Minnesota State Colleges & Universities
- Gene Hugoson, Commissioner, Minnesota Department of Agriculture
- Linda Martin, Associate Dean and Director of Academic Affairs, College of Food, Agricultural and Environmental Sciences - The Ohio State University
- Kent Thiesse, President-Elect, Minnesota School Board Association
- Joel Larsen, Program Specialist, Minnesota Department of Education
- Tim Penny, President/CEO, Southern Minnesota Initiative Foundation
- Jim Stone, Director, National Research Center for Career and Technical Education, University of Louisville

Following the panel discussion, summit attendees selected one of five concurrent sessions to discuss Listening Session findings and define logical next steps, which they determined to be: 1) creating a five to ten year blueprint for AFNRE that covers life-long learning, 2) continuing to form new partnerships with community groups, non-profit organizations, businesses, and schools, and 3) collaborating on the next steps toward strengthening AFNRE.

Working Group Meetings

A general call went out in August, 2011 to recruit working group members from the people who attended the Listening Sessions or *Connecting Summit*. Working group members served on one of five teams to develop an AFNRE Blueprint for each of the following AFNRE focus areas or sectors:

1. Agricultural Literacy
2. Secondary Education
3. Two-Year Post-Secondary Education
4. Farm Business Management
5. Baccalaureate and Above Education

The first working group meeting was held in October, 2011 with all members gathering to review their responsibilities, hear overviews of each topic area, and develop a *Strengths, Problems, Opportunities and Threats* (SPOT) analysis for each sector. Next, working groups met separately at various locations in the state in November and December, 2011 to synthesize an overall vision for their sector, elaborate on more specific aspects of the vision, and create *Bold Steps* for achieving their vision. *Bold Steps* are future steps that should be taken to strengthen and achieve the vision for AFNRE between 2012 and 2017.

Vision and *Bold Steps* Combined Working Session

Working groups and the Core Planning Team met on January 20, 2012 in St. Cloud, MN during the Minnesota Association of Agricultural Educators (MAAE) annual Agricultural Technology Conference. The goal was for each of the five working groups to review and come to consensus on vision statements for their sector and select their three to four highest priority *Bold Steps*. Once that was accomplished the entire group provided feedback that resulted in the development of a set of common *Bold Steps* for AFNRE as a whole.

Findings

The Blueprint consists of an overarching blueprint for AFNRE as well as more detailed blueprints for each of the five AFNRE sectors. Each blueprint consists of an overview or profile of the sector, a vision statement, and the top priority *Bold Step* that would be needed to accomplish the vision. Suggested strategies for implementing the AFNRE Blueprint based on the *Bold Steps* from each sector are described in the Recommendations section.

One of AFNRE's greatest strengths is that it involves many different educational institutions, businesses, public agencies, nonprofit organizations, individuals, and groups. This characteristic also represents a challenge for AFNRE development. The large number of players involved in AFNRE at so many levels throughout the state makes communicating and collaborating among them challenging. The AFNRE Blueprint is an initial step toward identifying and engaging all of the people and organizations with a stake in AFNRE and establishing a common vision and strategic plan for the ongoing development of AFNRE in Minnesota.

AFNRE Blueprint

Profile

AFNRE is made up of a wide variety of educational programs and systems operating in the state serving a diverse set of stakeholders and administered by several different public and private agencies or organizations. AFNRE serves a diverse clientele including elementary teachers searching for innovative ways to teach science, history, and social studies; rural and urban youth involved in 4-H and FFA programs, high school students making career and higher education choices, consumers making decisions about the kinds of food to purchase or how to manage their lawn or lakeshore property; farmers, extension educators, wildlife managers and other professionals employed in agriculture and in natural resource management; colleges, universities preparing students for higher education and careers; and businesses involved in wholesale and retail food processing, transportation, sales, and research.

A Vision for AFNRE

The vision for AFNRE is made up of an overall vision developed by the Core Planning Team and vision statements from each of the five sectors, developed by the working groups.

The vision for AFNRE is that it will provide lifelong learning in agriculture, food, natural resources, and the environment for youth and adults in Minnesota. AFNRE will:

- Ensure all people understand and value AFNR systems (Agricultural Literacy)
- Provide access to AFNRE and career exploration for all students in Minnesota (Secondary Education)
- Meet the needs of learners, industry, and the world (Two-year Colleges)
- Build farm business success, one informed decision at a time (Farm Business Management)
- Develop competitive and dynamic agricultural educators, communicators, and leaders (Baccalaureate and Above)

Bold Steps for AFNRE

The highest priority *Bold Steps* from each of the five working groups make up the *Bold Steps* for achieving the overall AFNRE vision. These *Bold Steps* serve as a starting place for guiding AFNRE toward its vision:

- Develop a curriculum map for agricultural literacy that is cross-referenced with common core academic standards
- Create innovative AFNRE program models that can be implemented in all secondary schools
- Meet the unfulfilled need in AFNR industries by creating awareness of current and future career opportunities through two-year college programs
- Develop a fiscally sound Farm Business Management program with a common vision and mission among all stakeholders
- Implement a strategic communication plan for baccalaureate and above education

A Blueprint for Agricultural Literacy

Profile

The goal of agricultural literacy programs is to educate youth and adults about the role and impact of agriculture and to support informed decision-making on the part of citizens and leaders regarding food, clothing, shelter, and the environment (National Research Council, 1988). Agricultural literacy is essential for informed decision-making in a world characterized by continued growth in world population leading to increased demand and costs for food, fiber, and fuel. In spite of the critical role of agriculture to the U.S. and global economy, most of the U.S. population has little understanding of agriculture and may take food production for granted because of its low cost and reliable supply. Recent popular books such as *Fast Food Nation* (Schlosser, 2002), *The Omnivore's Dilemma* (Pollan) have called attention to AFNR and raised issues of ethics, management and policy related to food production, resource use, and sustainability.

Agricultural literacy programs in Minnesota currently exist in K-12 and higher public education systems, within farm organizations such as the Farm Bureau and Farmers Union, agri-businesses, commodity groups, foundations and nonprofits. Minnesota state agencies support agricultural literacy through the programs such as the Department of Agriculture's *Agriculture in the Classroom*, the Department of Natural Resource's *School Forest Program*, and the Minnesota Historical Society's *Oliver Kelly Historical Farm*.

Vision

All people understand and value AFNR systems.

Bold Steps

1. Develop a curriculum map (framework or standards) for agricultural literacy that is cross-referenced with common core academic standards
2. Establish a statewide resource center for agricultural literacy education
3. Embed agricultural literacy in initial teacher licensure and renewal for all K-12 teachers

A Blueprint for Secondary Education

Profile

The mission of secondary AFNRE is to prepare middle and high school students for higher education and careers in the food, fiber, and natural resources system. Secondary AFNRE accomplishes this through an established AFNRE curriculum, Supervised Agricultural Experience, and FFA participation in agricultural literacy, career exploration, entrepreneurship, agricultural experience, and leadership development. AFNR secondary education programs typically include the following courses: Agriculture Exploration, Agriculture Business, Agriculture Mechanics, Horticulture, Forestry/Natural Resource Management, Work Experience, Combined AFNRE, and Animal Science.

Student data indicate approximately 29,600 students enrolled in an AFNRE course (32% female, 68% male) in grades 9-12 during the 2010-2011 school year, the most recent year for which data were available (Source: Carl Perkins Annual Report for 2010; duplicated count). Of these students, 8,808 were classified as “concentrators”, meaning they completed more than 240 hours of agricultural education courses. Approximately 4,248 students who enrolled in agriculture education courses satisfied science credit for graduation requirements through their AFNRE courses.

For the 2011-2012 academic year, there are 214 AFNRE licensed teachers (31% female, 69% male) in 185 programs in middle and secondary schools, a net gain of 1.6 full-time equivalent (FTE) teachers in the 2011-2012 academic year, which was an encouraging gain over the loss of 6.5 FTEs in 2010. Less than 10% of teachers had an extended contract of 30 days or longer in 2011-2012 compared to 35% of teachers in 2001. Reductions in extended contracts reduce the number of experiential learning and leadership development opportunities teachers can offer. Approximately 9,000 students are members of 170 FFA chapters throughout Minnesota and 2,500 take part in regional and state leadership camps and conferences.

Vision

Provide access to AFNRE and career exploration for all students in Minnesota.

Bold Steps

1. Rebrand AFNRE
2. Create innovative AFNRE program models that can be implemented in all secondary schools
3. Establish statewide AFNRE advisory board for secondary education
4. Address licensure and professional development needs and issues

A Blueprint for Two-Year Colleges

Profile

AFNRE is offered through over 40 programs in the Minnesota State Colleges and University system at more than 15 colleges and enrolls more than 2,000 students in one or more AFNRE courses annually. AFNRE programs in two-year programs have enjoyed record high student enrollment—especially among nontraditional students—and record high demand for graduates in recent years.

Instruction is led by passionate faculty members who effectively integrate technical education, personal growth and leadership, and work-based learning. AFNRE offers a diverse set of programs including: Agribusiness Management, Agronomy, Biotechnology, Environmental Science, Ecology, Hydrology, Earth Sciences, Field Biology, Natural Resources, Wilderness Management, Pre–Agricultural and Pre–Veterinarian studies, Food Science Technology, Culinology®—“the collaboration between culinary expertise and food science”, and Hospitality Management.

Vision

Two-year postsecondary AFNR education will meet the needs of learners, industry, and the world.

Bold Steps

1. Meet the unfulfilled need in AFNR industries by creating awareness of current and future career opportunities
2. Create new partnerships between education and business to meet the equipment and training needs of careers in AFNR
3. Create relevant global educational experiences to expand Minnesota markets and prepare students to participate in global markets

A Blueprint for Farm Business Management

Profile

Minnesota State Colleges and Universities Farm Business Management (FBM) Education programs are administered through eight college campuses. There are a total of 65 FBM instructors serving nearly 3,000 Minnesota farm owners and operators and others interested in farming. The FBM program assists students in meeting their business and personal goals

through the use of quality farm records and sound business decisions for effective financial management. Instructors in FBM programs deliver instruction by meeting regularly with students at their place of business to evaluate the business and develop individual educational plans. Instruction is also delivered in the traditional classroom, small group meetings, field trips, and tours.

The state of Minnesota is divided into six regions which are managed by five Regional Deans or Program Directors of Management Education. Students may participate in the following diploma programs: 1) Farm Business Management, 2) Advanced Farm Business Management, 3) Agricultural Commodities Marketing, 4) Lamb and Wool Management, and 5) Specialty Crops Management.

Vision

Building farm business success, one informed decision at a time.

FBM's mission is to build enduring business and entrepreneurial knowledge that is dynamic, adaptive, practical, responsible, and renewable that: creates financial data which enables rigorous analysis of their business; enhances business planning that is both tactical and strategic, leading to quality decisions that solve management dilemmas, and achievement of family and business goals, resulting in business, community, state, and national economic development.

Bold Steps

1. Develop a fiscally sound program with a common vision and mission among all stakeholders
2. Explore structural options to assure consistent statewide program management
3. Market the program through business, state, and national partnerships

A Blueprint for Baccalaureate and Above Education Programs

Profile

Agricultural Education is currently housed in two colleges within the University of Minnesota (UMN) system. The undergraduate program is one of 12 majors in the College of Food, Agricultural and Natural Resource Sciences (CFANS) and is part of the Division of Agricultural Education and Applied Economics. Undergraduate programs in agricultural education are offered at the Crookston and Twin Cities campuses of the UMN. The graduate program is administered by the College of Education and Human Development (CEHD) and is located in the Department of Organizational Leadership, Policy, and Development (OLPD) on the Twin Cities Campus.

Agricultural Education is supported and led by a faculty of seven staff members with experience in K-12 and higher education and in AFNR business. The staff consists of two UMN-Twin Cities campus tenure track faculty (Dr. Jim Leising, Dr. Brad Greiman), one UMN-Crookston campus tenure track faculty (Dr. Lyle Westrom); one Emeritus Professor (Dr. Roland Peterson), two Instructors (Jim Swiggum, Julie Tesch), and one Recruiter and Academic Advisor (Melissa Norby).

A small number of students in the undergraduate program transfer from two-year colleges in Minnesota or from other programs in the UMN system and most students enter the program as freshmen. About half specialize in Agricultural Education Teacher Licensure and half in Agricultural Leadership and Communication. These specializations prepare students to teach in formal and nonformal education programs for youth and adults and for careers in AFNR organizations and businesses, respectively. There continues to be a strong demand for undergraduates in both specializations.

Students in the graduate program may pursue a Master of Education (M.Ed.) degree as an alternative teacher licensure pathway or a Master of Arts, Doctor of Education, or Doctor of Philosophy, specializing in Agriculture, Food and Environmental Education. Students who complete the M.Ed. program are qualified to teach agricultural education and serve as extension educators and 4-H program coordinators. The lack of funding for graduate assistantships and the class offerings being restricted to the UMN-Twin Cities campus have limited enrollment in the M.A, Ed.D., and Ph.D. programs.

Vision

Develop competitive and dynamic agricultural educators, communicators, and leaders.

Bold Steps

1. Implement a strategic communication plan
2. Create active, diverse and strategic working groups
3. Aggressively identify, recruit, and retain an increased number of Agricultural Education teacher candidates from diverse backgrounds
4. Become a model of excellence in integrating technology in education, communication, and leadership

Summary

In summary, through a systematic listening and learning process conducted from 2010 to 2012, MAELC has identified stakeholders' views that AFNRE plays an essential role in contributing to a healthy economy, preparing the workforce, creating positive consumer awareness of food, agriculture and the environment, and having a positive impact on student learning. It has convened working groups and a Core Planning Team made up of diverse experts and practitioners representing agricultural literacy programs, secondary education, two-year colleges, Farm Business Management programs within the Minnesota State Colleges and University system, and undergraduate and graduate programs at the University of Minnesota. The committed efforts of the working groups and the Core Planning Team produced an AFNRE Blueprint that addresses these important roles and responsibilities and recommends Bold Steps and strategic guidelines for achieving a unified vision for AFNRE. It is MAELC's sincere hope and expectation that these efforts will inspire on-going efforts on the part of policy-makers at the local and state level and encourage the continued engagement of existing and new partners to support an exemplary system of education in and for agriculture, food, and natural resources for Minnesota now and in the future.

Recommendations

The following six strategic guidelines for implementing the AFNRE Blueprint are based on analysis of all sector vision statements and high priority *Bold Steps* developed at the January, 2012 combined working groups meeting and input from the Core Planning Team. The guidelines are proposed as recommendations for implementing the AFNRE Blueprint. Appendix F lists each working group's vision and priority *Bold Steps* and aligns them to one or more of the six strategic guidelines for AFNRE Blueprint implementation:

1. Explore communication and marketing strategies for rebranding and attracting new audiences for AFNRE
2. Create a mechanism for collaboration and information-sharing to support AFNRE in Minnesota
3. Develop new partnerships to guide the development of AFNRE
4. Address curricular, professional development, technology, and licensure issues to recruit and develop high quality and diverse AFNRE educators and programs
5. Establish an advisory board and/or strategic working groups to provide input for AFNRE program development
6. Address needs and issues of the global marketplace in AFNRE programs

Each of the recommended strategic guidelines is described in detail below.

1. Explore communication and marketing strategies for rebranding and attracting new audiences for AFNRE

Four of the five working groups identified some aspect of this *Bold Step* as key to achieving their vision. Rebranding AFNRE was seen as a way to attract new and underserved or underrepresented groups to AFNRE, create awareness of current and future career opportunities in AFNRE, recruit greater numbers of more diverse teacher candidates, establish a common vision and mission among diverse stakeholders, and effectively market programs, specifically FBM programs.

2. Create a mechanism for collaboration and information-sharing to support AFNRE in Minnesota

Although this *Bold Step* was put forward in the context of creating a statewide center for agricultural literacy, it may be a mechanism or venue for coordinating all AFNRE sectors in Minnesota. It may also serve as a focal point for providing leadership, attracting new audiences, improving marketing and communication, developing new partnerships, creating new curricula and uses of technology for instruction.

3. Develop new partnerships to guide the development of AFNRE

New partnerships were seen as a way to attract new audiences to AFNRE, improve career preparation and development for individuals working in diverse AFNRE businesses, strengthen recruitment of teacher candidates, develop innovative uses of technology in AFNRE instruction, and market AFNRE programs. Depending on the types of partnerships envisioned, this *Bold Step* may also support the development of a global perspective on instruction and career preparation.

4. Address curricular, professional development, technology, and licensure issues to recruit and develop high quality and diverse AFNRE educators and programs

This guideline encompasses a broad spectrum of activities to improve instruction for a diverse and expanded learner or audience base for AFNRE. It addresses what to teach, how to teach, where to teach, who to teach, and who can teach AFNRE.

5. Establish an advisory board and/or strategic working groups to provide input for AFNRE program development

Two working groups (Secondary Education and Baccalaureate and Above) identified *Bold Steps* directly related to this guideline as a way to support the development of AFNRE. It may also be a mechanism to address *Bold Steps* proposed by the FBM working group. Depending on how it is envisioned, it may also be an aspect of a statewide collaboration and information-sharing mechanism for AFNRE.

6. Address the needs and issues of the global marketplace in AFNRE programs

Although this *Bold Step* was put forward by only one working group (Two-Year Post-Secondary), addressing the global nature of AFNRE was part of the vision or *Bold Steps* of all working groups. It is seen as a way to attract diverse audiences, establish new partnerships, and develop innovative curricula and training opportunities for AFNRE.

Next Steps

The AFNRE Core Planning Team and MAELC intend to disseminate the AFNRE Blueprint to the Minnesota State Legislature at FFA Day at the Capitol on February 23, 2012. MAELC will also distribute the AFNRE Blueprint widely throughout the state and to key stakeholders who have been involved with its development since 2010. The Core Planning Team believes it is essential to continue the dialogue with all AFNRE stakeholders in order to develop a strategic plan that is feasible and responsive to the needs of the AFNRE community. The AFNRE Blueprint development process has intentionally used a bottom-up approach to ensure the representation of diverse stakeholders who may not previously have been included in AFNRE decision-making. This grassroots approach was also used to increase ownership of the AFNRE Blueprint by its many enthusiastic developers. MAELC will support efforts to encourage the use and further development of the AFNRE Blueprint to ensure the continued growth and development of a robust and high quality AFNRE system for Minnesota.

Appendix A: USDA Report on Career Opportunities in Agriculture, Food, and Natural Resources

Source: <http://www.ag.purdue.edu/usda/employment/pages/default.aspx>

Employment Opportunities for College Graduates in Food, Renewable Energy, and the Environment; United States, 2010-2015

Overview

The agricultural, food, and renewable natural resources sectors of the U.S. economy will generate an estimated 54,400 annual openings for individuals with baccalaureate or higher degrees in food, renewable energy, and environmental specialties between 2010 and 2015. Seventy-four percent of the jobs are expected in business and science occupations; 15 percent in agriculture and forestry production; and 11 percent in education, communication, and governmental services.

During 2010–15, five percent more college graduates with expertise in agricultural and food systems, renewable energy, and the environment will be needed when compared to 2005-10. More than enough graduates will likely be available during the next couple of years in some occupations, but a shortfall of new graduates with preparation in priority business and science specialties is forecast in the latter half of the period.

Four major factors shape the market for graduates between 2010 and 2015:

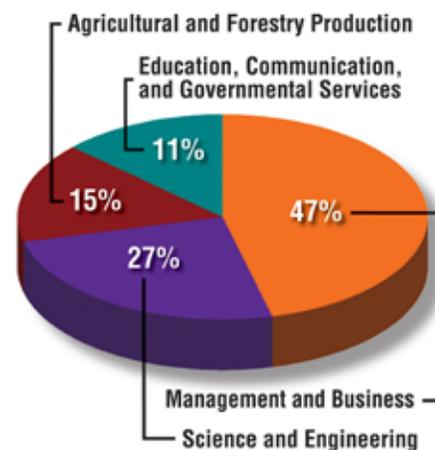
- Macroeconomic conditions and retirements
- Consumer preferences for nutritious and safe foods
- Food, energy, and environment public policy choices
- Global market shifts in population, income, food, and energy

GRADUATES

Expect approximately 53,500 qualified graduates to be available each year. About 55 percent of the total, 29,300 are expected to earn degrees from colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine. The other 45 percent, an estimated 24,200 graduates, will come from allied disciplines including biological sciences, engineering, health sciences, business, and communication.

Employers have expressed a preference for graduates from colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine who tend to have relatively stronger interests and more extensive work experiences for careers in food, renewable energy, and the environment than those from allied fields of study. These graduates will likely continue to be preferred by many employers, but it is important to note that there were nearly 10 percent fewer agriculture and life sciences, forestry and natural resources, and veterinary medicine graduates produced in U.S. colleges and universities in 2008 than in 2002.

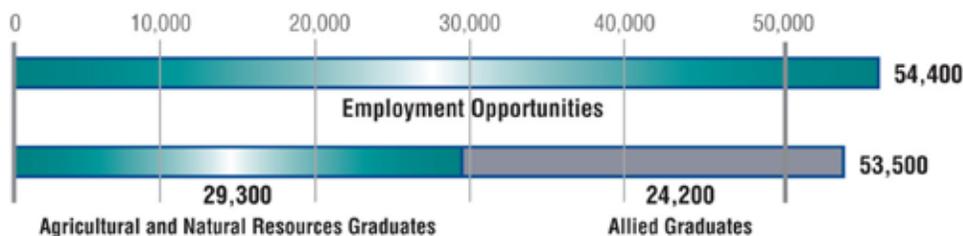
Employment Opportunities



The Food and Agricultural Education Information System maintains enrollment data by academic specialty that are reported by colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine. Enrollments during 2004-09 suggest some increases in agribusiness management, agricultural mechanization and engineering, animal science, food science, and natural resources management graduates during 2010–15. In contrast, fewer graduates in the plant sciences, soil sciences, and horticultural specialties are anticipated during the next five years, and there will likely be little change in the annual production of forestry and wildlife science graduates.

Relatively more graduates from the allied fields of biological and health sciences will be required to fill positions that address consumer preferences for a safe and nutritious food supply. Likewise, more earth and atmospheric scientists and environmental engineers will be required to deal with the evolving public policy choices in energy and the environment.

Shortfalls of qualified graduates to work as plant geneticists and plant breeders, climate change analysts, and food safety and security specialists are anticipated during 2010–15.



GROWTH OCCUPATIONS

The U.S. Department of Labor projects significant growth in selected food, renewable energy, and environment jobs during 2008–18 in the *Monthly Labor Review* published in November 2009.

Occupation – Percent Increase

Agricultural Inspectors – 12.8

Animal Scientists – 13.2

Biochemists and Biophysicists – 37.4

Computer and Information Systems Managers – 16.9

Credit Analysts – 15.0

Environmental Engineers – 30.6

Environmental Scientists and Specialists, including Health – 27.9

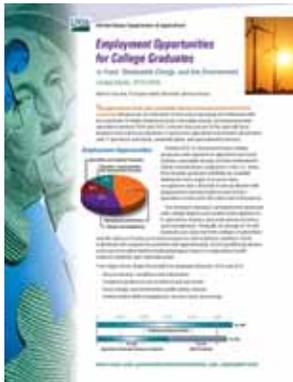
Financial Analysts – 19.8

Food Scientists and Technologists – 16.3

Hydrologists – 18.3

Management Analysts – 23.9
Market Research Analysts – 28.1
Natural Sciences Managers – 15.5
Pest Control Workers – 15.3
Public Relations Specialists – 24.0

Recreation Workers – 14.7
Sales Managers – 14.9
Soil and Plant Scientists – 15.5
Technical Writers – 18.2
Veterinarians – 33.0



Projected growth in these occupations is in tune with our nation's shift toward creating new businesses and jobs in local and regional food systems, capitalizing on climate change opportunities, developing renewable energy, and restoring and sustaining natural resources.

The ability to maintain a safe food supply that is more affordable and nutritious while also expanding energy production from renewable sources will increasingly depend upon the strategic integration of action teams. Those teams will need strong research and development and efficient business management skills. There will be growing opportunities for specialists who will manage our nation's water resources.

Project Consultants

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This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under Award No. 2007-38837-18626. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Appendix B: MAELC Resolution 2011-01

MINNESOTA AGRICULTURAL EDUCATION LEADERSHIP COUNCIL

RESOLUTION 2011-01

AUTHORIZING THE

MINNESOTA AGRICULTURAL, FOOD and NATURAL RESOURCES EDUCATION BLUE
PRINT

UNDER THE MINNESOTA AGRICULTURAL EDUCATION LEADERSHIP COUNCIL

WHEREAS, Minnesota is a leading state in agriculture, yet it is facing a shortage of agriculture students, teachers and well-trained workers;

WHEREAS, new audiences across Minnesota are realizing the importance of agriculture, food and natural resources in their daily lives;

WHEREAS, a collaborative network approach of organizations helping to promote the importance of agricultural education will provide efficiency and effectiveness in the use of resources to promote expanding Agricultural, Food and Natural Resources Education;

WHEREAS, over 300 people participated in eight listening sessions during the summer of 2010 to give their thoughts and views on Agriculture, Food and Natural Resources Education;

WHEREAS, a successful Agriculture, Food, and Natural Resources Summit was held in December 2010 with over 200 people in attendance;

WHEREAS, working groups will be formed around the following areas, but not limited to:

1. AFNR Education Recommendations in Preparing the Workforce and Creating a Healthy Economy
2. AFNR Education Recommendations in Secondary Education
3. AFNR Education Recommendations in Post-Secondary Education
4. AFNR Education Recommendations in Farm Business Management
5. AFNR Education Recommendations in Building Agriculture, Food and Environmental Literacy

WHEREAS, Minnesota Statute section 41D.01 establishes the general powers of the Minnesota Agricultural Education Leadership Council to: (1) develop recommendations to the legislature and the governor and provide review for agriculture education programs in Minnesota; (2) coordinate and articulate Minnesota's agriculture education policy across all programs and institutions; (3) identify the critical needs for agriculture educators; (4) serve as a link between the agribusiness sector and the agriculture education system to communicate mutual concerns, needs, and projections; (5) establish and maintain an increased awareness of agriculture education and its continued need to all citizens of Minnesota; (6) gain broad public support for agriculture education in Minnesota; and

NOW, THEREFORE BE IT RESOLVED that the Minnesota Agricultural Education Leadership Council develop an Agricultural, Food and Natural Resources Education Blueprint for Minnesota to make policy and funding recommendations to the Minnesota Legislature and stakeholders that will promote the development of Agricultural, Food and Natural Resources Education programs across Minnesota.

Adopted by the Minnesota Agricultural Education Leadership Council this 17th day of June, 2011.

By: _____
Co-Chair

Attest: _____
Board Member

Appendix C: Names and Affiliations of AFNRE Blueprint Contributors

The following list includes the names and affiliations all of the 76 people who were involved at some phase of the development of the AFNRE Blueprint.

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Appendix D: Listening Session Discussion Questions

Facilitator Questions:

1. Create a healthy economy

- How are business, industry, and community needs changing?
- What should the roles be for agriculture, food, and natural resources education in developing a strong Minnesota economy?
- How can connecting all the growth opportunities in agriculture, food, and natural resources create a healthy economy?
- How do we engage new partners to create a healthy economy?

2. Prepare the workforce

- What roles should business and industry have in student learning?
- How do you strike a balance between technical knowledge and soft skills?
- How can connecting all the growth opportunities in agriculture, food, and natural resources prepare the workforce?
- How do we engage new partners prepare the workforce?

3. Build awareness of food, agriculture and the environment

- How can agriculture, food, and natural resources systems be more responsive to changing societal trends?
- How can business, industry, and communities partner with education to increase literacy of food, agriculture, and natural resources for all youth and adults in Minnesota?
- How can connecting all the growth opportunities in agriculture, food, and natural resources build great consumer awareness and understanding?
- How do we engage new partners to build awareness of food, agriculture and the environment?

4. Student Learning

- What is the desired program delivery of food, agriculture and natural resources for individuals at the secondary, college and university levels?
- What will be the purposes of agriculture, food, and natural resources in education?
- How can connecting all the growth opportunities in agriculture, food, and natural resources have a positive impact on student learning?
- How do we engage new partners to have a positive impact on student learning?

Appendix E: Working Groups' Initial Visions and Bold Steps (October-November, 2011 Working Group Meetings)

AFNR Literacy

Vision Statement

All citizens understand and value agriculture, food, and natural resource systems.

Vision Themes/Supporting Ideas

- All K-12 teachers will have professional development about agriculture
- Agriculture, food, and natural resources is a context in core academic classes to increase student achievement
- Opportunities exist for Minnesotans to experience (see, touch, taste, experience) agriculture
- Diverse partners and stakeholders coordinate agricultural, food, and natural resource literacy efforts and leverage resources
- Industry professionals are enlisted to highlight the roles of research, science, environmental management, food, fuel, and landscape design in agriculture, food, and natural resources (education)

Bold Steps

- An agricultural literacy component is embedded into the Specific Professional Development Activities required for teacher license renewal
- Resources are designed for teacher professional development and informal education (e.g. home school, after school, 4-H, daycare)
- Opportunities are created for teacher professional development and for informal educators
- Infuse agricultural content into the teaching of the common core
- Create state standards for agricultural literacy
- Establish a statewide center for agricultural literacy that:
 - a. Is a clearinghouse of instructional resources and activities
 - b. Provides a Speakers Bureau of agriculture issues that would involve industry volunteers
 - c. Establishes a website presence
 - d. Maintains a support system for participants
 - e. Provides a Hotline
 - f. Provides outreach to target new audiences
 - g. Represents an alliance for agricultural, food and natural resources education
- Increase staff in the Minnesota Department of Education by hiring a specialist in agriculture for elementary

AFNR Secondary Education

Vision Statement

Agricultural, food, and natural resources education is available to all communities

Vision Themes/Supporting Ideas

- Engaged community stakeholders, including alumni and advisory groups support programs
- Literacy in AFNR is promoted
- Programs consist of instruction, experiential learning, and leadership components
- Students are able to explore careers, make informed choices, contribute to society and community through AFNR

Bold Steps

- Create an alternative framework for program/resources
- Rebrand AFNR (adjust paradigm) to clarify its purpose and expand its audience
- Create an alternative licensure model to meet future demand for teachers (Family and Consumer Science, science, business, natural resources, technology, social studies)
- Establish a statewide AFNR advisory board for secondary education
- Provide AFNR programming in middle and secondary schools statewide (in every public district, charter, and private school)
- Create a program model flexible enough to establish an AFNR program to meet each community's needs
- Use or develop a management model utilizing community resources and its diversity

Two-Year Post-Secondary Education

Vision Statement

Two-year post-secondary AFNR education will meet the needs of learners, industry, and the world

Vision Themes/Supporting Ideas

- Serve needs of all learners in AFNR, including the underrepresented and underserved
- Broaden the definition of student success beyond program completion
- Establish partnership between business and education
- Programs provide student access to and an institutional presence in international settings
- Flexible and relevant education and training meets the technical education, critical thinking, and employability needs of industry
- Communication, coordination, and collaboration occurs across public higher education
- Relevant and effective alignment exists within the P-20 (pre-school to graduate school) educational system
- A positive perception of two-year campuses and education is widespread
- All needed AFNR pathways are addressed in the two-year college system

Bold Steps

- Create a coordinated marketing campaign to promote AFNR education and (career) opportunities
- Improve articulated pathways for transferability between P-20 educational institutions
- Enhance partnerships between education and business to better meet the equipment and training needs of students and industry
- Create international internship or travel opportunities for students
- Update 2-year technical faculty credential requirements to more accurately reflect current AFNR instructional needs
- Expand professional development opportunities for AFNR faculty
- Increase enrollment in AFNR programs, including students from diverse populations and low skill and unskilled workers

Farm Business Management

Vision Statement

FBM will be the:

- Leading source of business management education for Minnesota farmers,
- Preferred source of business management education for Minnesota farmers,
- Recognized leader for adding value to farm businesses,
- Premier provider of management education for farm businesses,
- Most critical input “for/element of farm” business success.

Vision Themes/Supporting Ideas

- Uses leading edge instructional technology
- Positions producers for global competitiveness
- Contributes to economic development and vitality
- Uses database and benchmarking
- Is a trusted source of tailored business education

Bold Steps

- Adopt a common vision for the program
- Position the program to be fiscally sound
- Further develop state and national partnerships
- Support research of the FBM database for use in instructional delivery and program marketing
- Expand the use of instructional technologies to enhance programming

Baccalaureate and Above Education Programs

Vision Statement

Student success is ensured by offering a relevant and rigorous curriculum in agricultural education, communication, and leadership with links to science and technology. We aspire to foster relationships through local, national, and global partnerships to deliver a competitive and dynamic program.

Vision Themes/Supporting Ideas

- Curricula for undergraduate and graduate programs is futuristic, internationalized, and responsive to changing student needs
- Sustainable programs involve universities and colleges (e.g., University of Minnesota, Minnesota State Colleges and Universities) and gain political support
- Collaborative partnerships with AFNR industry/organizations, government, and education institutions exist and support programs
- Strategic communication consisting of brand, image, and marketing is developed and implemented
- Continuing professional development is available and accessible

Bold Steps

- Conduct a comprehensive review and critique of the Agricultural Education undergraduate and graduate curricula based upon student, faculty, alumni, industry, government, education, and other stakeholder input. Initiate a redesign based upon recommendations
- Invite stakeholders to be part of an Agricultural Education advisory committee to provide regular and ongoing input through an iterative process
- Consider selecting a new name for the Agricultural Education undergraduate major to better represent the redesigned curriculum
- Initiate a strategic communication plan consisting of brand, image, and marketing
- Strengthen and expand existing partnerships to identify, recruit, and retain an increased number of teacher candidates in Agricultural Education
- Expand collaborative partnerships with selected Twin Cities Metro schools, businesses, and organizations to better accomplish the vision of all parties
- Increase the use of instructional technology such as blended formats, web conferencing, and multimedia web delivery for teaching the Agricultural Education curriculum
- Seek and invite financial support to become nationally recognized undergraduate and graduate programs in Agricultural Education
- Explore the feasibility of a regional partnership focused on teacher development in Agricultural Education

Appendix F: Alignment of Working Group *Bold Steps* with Strategic Guidelines

Working Group Vision and <i>Bold Steps</i>	Strategic Guidelines*					
	1	2	3	4	5	6
Agricultural Literacy Vision: All people understand and value AFNR systems						
Develop a curriculum map (framework or standards) for agricultural literacy that is cross-referenced with common core academic standards				X		
Establish a statewide resource center for agricultural literacy education		X				
Embed agricultural literacy in initial teacher licensure and renewal for all K-12 teachers				X		
Secondary Education Vision: Provide access to AFNRE and career exploration for all students						
Create innovative AFNR program models that can be implemented in all secondary schools				X		
Rebrand AFNR (adjust paradigm)	X					
Establish a statewide AFNR advisory board for secondary education					X	
Address licensure and professional development needs & issues				X		
2-Year Postsecondary Vision: AFNRE will meet the needs of learners, industry, and the world						
Meet the unfulfilled need in AFNR industries by creating awareness of current & future career opportunities	X					
Create new partnerships between education and business to meet the equipment and training needs of careers in AFNR			X			
Create relevant global educational experiences to expand MN markets and prepare students to participate in global markets.						X
Farm Business Management Vision: Build farm business success, one informed decision at a time						
Develop a fiscally sound program with a common vision & mission among all stakeholders	X				X	
Explore structural options to assure consistent statewide program management					X	
Market the program through business, state, & national partnerships	X		X			
Baccalaureate and Above Vision: Develop competitive and dynamic agricultural educators, communicators, and leaders						
Implement a strategic communication plan for AFNRE	X					
Create active, diverse, and strategic working groups for AFNRE development					X	
Aggressively identify, recruit, & retain more and more diverse teacher candidates	X		X			
Become a model of excellence in integrating technology in education, communication, and leadership			X	X		

*Strategic Guidelines: 1. Communication, marketing, rebranding, new audiences; 2. Statewide collaboration and information-sharing mechanism; 3. New partnerships; 4. Curriculum, professional development, technology, licensure; 5. Advisory board/strategic working groups; 6. Global marketplace

Mission Statement

MAELC provides leadership to expand and grow agricultural education in Minnesota



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