

# University of Minnesota Combined Research and Extension Plan of Work 2021-2025

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## I. Plan Overview

### 1. Executive Summary

This plan of work describes the overall goals of the University of Minnesota's Agricultural Experiment Station (MAES) and Extension. Specifically, MAES supported research and Extension education programs will be reported as they address 10 critical issues. These issues tap the capacity and scholarship of the University of Minnesota and are of particular importance to the constituents of the state of Minnesota. The issues were chosen to feature impacts that Extension and MAES are strongly qualified to address. Each of them is critical because they affect Minnesota's economy, quality of life, and the future viability of our state and its residents. Research and Extension are evolving strategies to address these issues, acknowledging that:

1) Markets and economies are instable, so profitability and margins should be addressed within industry and communities; 2) Minnesota's citizens, businesses and communities are seeking data to drive their decision-making; 3) Democratic shifts require new education to tap the skills and capacity of all Minnesotans; 4) Learning styles and learning tools are changing with technological advances; 5) Increased access to information requires the University of Minnesota to broker quality information; and, 6) Connections to stakeholders, learners, industries and communities are now more possible than ever, and opportunities to manage a "feedback loop" with these stakeholders is critical.

Extension and the MAES will report future results and expenditures related to all of the critical issues listed. Some critical issues will be addressed primarily by just one of those units. (For example, Youth Development will largely be addressed by Extension programs). Joint impacts will describe how research from the MAES and programs from Extension have come together to make a difference.

Several of the identified critical issues deal with broad interdisciplinary challenges Minnesota is facing. For example, as the MAES and Extension work to feed a growing world population and support farm profitability, it is critical to protect Minnesota's natural resources and ensure strong local economies and healthy and productive citizens. In 2021, a short-term critical issue will discuss MAES and Extension responses to help Minnesota adapt to the impact of COVID-19.

The MAES funds research in five University colleges and, for the purposes of this report, sorts these projects into the critical issues discussed here. Extension funds four centers and taps the expertise of six academic affiliates with expertise in key disciplines. These centers plan responsive programs and initiatives through the work of program teams that develop, design, deliver and evaluate education and consultation in collaboration with local partners.

Supported researchers and Extension program teams regularly reach target audiences, examine stakeholder input, assure merit review of staff and programs, evaluate efforts and update program and project designs. Working alongside these teams are administrative structures that support programs and projects, manage stakeholders and communicate the value of the land-grant system to Minnesota and beyond.

### Mission Statements

#### University

The University of Minnesota (University), is founded in the belief that all people are enriched by understanding, is dedicated to the advancement of learning and the search for truth; to the sharing of knowledge through education for a diverse community; and to the application of this knowledge to benefit the people of the state, the nation, and the world. The University's mission, carried out on multiple campuses and throughout the state, is threefold:

Research and Discovery - To generate and preserve knowledge, understanding, and creativity by conducting high-quality research, scholarship, and artistic activity that benefit students, scholars, and communities across the state, the nation, and the world.

Teaching and Learning - To share that knowledge, understanding, and creativity by providing a broad range of educational programs in a strong and diverse community of learners and teachers, and prepare graduate, professional, and undergraduate students, as well as non-degree seeking students interested in continuing education and lifelong learning, for active roles in a multiracial and multicultural world.

Outreach and Public Service - To extend, apply, and exchange knowledge between the University and society by applying scholarly expertise to community problems, by helping organizations and individuals respond to their changing environments, and by making the knowledge and resources created and preserved at the University accessible to the citizens of the state, the nation, and the world.

## Extension

The University of Minnesota Extension is making a difference by connecting community needs and University resources to address critical issues in Minnesota. Extension plays a key role in the University of Minnesota's mission by bringing Minnesotans together to build a better future through University science-based knowledge, expertise and training. Extension works in rural, suburban, urban and tribal communities and beyond.

## MAES

The Minnesota Agricultural Experiment Station supports the research mission of the University of Minnesota by managing the distribution and use of federal and state funds with a focus on production, harvesting, processing, quality and marketing of food and agricultural products, and forests and forest products. The goals of these efforts are to improve human nutrition, family and community life, tourism and environmental quality.

## Strategic Plan

### MAES and Extension Joint Priorities and Goals

Extension and the MAES will work together from 2021-2025 to: 1) Enhance the scholarship of programs and faculty; 2) Increase the use of technology for teaching and learning; 3) Strengthen connections between research, extension programming and communities' assessed needs; 4) Analyze the outcomes and impacts of programming and research; 5) Strengthen the diversity of programs and improve the cultural competence of staff; 6) Increase the impact of both research and outreach through multidisciplinary research and collaborative learning partnerships; and, 7) Collaborate with the University to achieve operational excellence.

In order to address critical issues in light of current trends, key initiatives for research and Extension from 2021-2025 will: 1) Address diversity and changing populations and needs in Minnesota; 2) Modernize access to education and research by adopting new technology and migrating information to new formats; 3) Increase the degree to which we come together for interdisciplinary problem-solving; and, 4) Encourage multistate and regional projects and partnerships.

## Extension Strategic Plan

As part of Extension's 110th anniversary in 2019, Dean Beverly Durgan convened a committee of professionals representing all parts of Extension to refresh the organization's strategic plan and set a course for the next decade. Extension's 2020 Strategic Plan establishes a baseline of expectations and assumptions to lead Extension to "A Pathway Forward" in the coming years. Goals and strategies described in the plan respond to emerging challenges and

opportunities and the need for new approaches to fulfill the land-grant mission. These trends include globalization and a competitive marketplace of ideas; an increasingly diverse society; game-changing technological advances; broad and variable funding streams; and eroding public trust of hierarchical, traditional systems.

The 2020 Extension Strategic Plan: A Pathway Forward is built around the three essential components – scholarship, engagement and systems – that have guided Extension through more than a century of creating public value for Minnesota and beyond. This framework will focus and guide planning and decision-making across Extension. Working within this vision, Extension centers and programs will adapt goals and strategies to meet stakeholder needs while remaining consistent with the larger organization's priorities and plans.

**Engagement:** Extension engages in meaningful ways with individuals, families, communities and stakeholders to lead and advocate for positive change across Minnesota, the nation and the world. Relationships grounded in mutual trust and understanding allow Extension to respond nimbly and effectively when its expertise are needed. Strategies for engagement are to:

1) Establish and maintain mutually beneficial relationships in the diverse communities where Extension people live and work; 2) Co-create approaches and solutions that empower individuals and communities to thrive and evolve in all stages of life and circumstance; and, 3) Innovate and bring forward new ideas by supporting opportunities for partnerships and collaboration.

**Scholarship:** Extension excels as the trusted, go-to source for information advancing research, education and solutions that reflect Minnesota communities and their social, economic and environmental needs. Research-based scholarship and academic excellence are the foundation for Extension's public value. Strategies for scholarship are to:

1) Expect rigorous scholarship programs, tools and methods to meet the challenges of a changing world; 2) Collaborate across disciplines and geography to anticipate, identify, address and innovatively respond to key needs; and, 3) Adapt and embrace technology as a tool for addressing grand challenges and critical societal issues.

**Systems and people:** Extension consistently promotes efficient, effective and integrated structures and practices that reduce administrative barriers to innovation and collaboration. Extension stakeholders understand that the organization's public value is rooted in a culture of belonging and inclusiveness. Strategies for systems and people are to:

1) Attract and retain high-quality, passionate employees through consistent and effective on-boarding, professional development, mentorship, promotion and retention; 2) Weave diversity, equity and inclusion into all aspects of Extension's programming and employee engagement; and, 3) Find new and innovative ways to tell the Extension story and to share the value that Extension brings to its stakeholders and the public.

## MAES Strategic Plan

In recent years, the MAES has prioritized updating both specialized research instrumentation and the expanding capability to conduct intensive field research. For example, the U of M has one of the most extensive facilities of controlled environment chambers for plant growth among U.S. Universities. The MAES provides centralized support and management to enable the systematic replacement and updating of the growth chamber network and its control systems and walk-in research coolers and freezers. This investment results in enhanced research capacity, capability, and energy savings.

The MAES supports cross-disciplinary problem solving and responds to emerging issues by funding research in five University of Minnesota colleges: College of Food, Agricultural and Natural Resource Sciences, College of Veterinary Medicine, College of Biological Sciences, College of Design, and College of Education and Human Development. Supporting the research missions of these colleges is a major priority of the MAES. Research priorities of the five partner colleges are highlighted below and many of them are reflected in the descriptions of the critical issues selected for future reporting:

### College of Food, Agricultural and Natural Resource Sciences

The College of Food, Agricultural and Natural Resource Sciences' (CFANS) vision is to advance Minnesota as a global

leader in food, agriculture and natural resources through extraordinary education, science-based solutions and dynamic public engagement that nourishes people and enhances the environment in which we live. As part of this effort, CFANS leads 10 unique Research and Outreach Centers in communities throughout Minnesota. The centers support research that enhances the quality of agricultural production, human health, renewable energy and the environment and disseminate the benefits of this research to the public.

Six research and discovery platforms make up a key component of the CFANS strategic vision and roadmap they are: 1) Big data and insight; 2) Climate Adaptation; 3) Microbiomes; 4) Novel crop development; 5) Integrated animal systems biology; and, 6) Water resources management.

### College of Veterinary Medicine

The College of Veterinary Medicine (CVM) is a pioneer and an internationally recognized leader in animal health research. CVM is uniquely positioned to provide solutions to current and emerging problems at the interface of animals, humans, and the environment that threaten animal and human health. These problems are global, interlaced, and complex, and require multidisciplinary integrated approaches that unify biology and medicine.

Researchers in CVM aim to reveal and resolve the increasingly intertwined elements of animal and human health in our environment based on the concept of One Medicine and One Science. In addition, as part of CVM's Strategic Plan for Research, three Signature Programs were developed to address the need for local and global solutions to health threats at the interface of animals and humans. These programs are focused on three areas of critical importance and are areas in which CVM has significant strengths, key allied colleagues within the University, and core stakeholder groups in both the University and the larger community. The Signature Programs are: 1) Comparative medicine; 2) Population systems; and, 3) Emerging zoonotic and infectious diseases.

### College Biological Sciences

One of only two colleges in the country dedicated to the biological sciences, the College Biological Sciences (CBS) brings together researchers who are advancing knowledge of life at every scale from molecules to ecosystems. CBS researchers make discoveries across the biological sciences from illuminating the mechanisms of cancer to engineering enzymes to clean up pollutants in the environment.

CBS has invested in building capacity at the leading edge of the biological sciences as part of a drive to foster collaboration and build research momentum in key areas. The first of its kind, the Department of Biology Teaching and Learning builds on CBS's reputation for innovation in biology education.

### College of Education and Human Development

The College of Education and Human Development's (CEHD) vision is to advance research, teaching, and community engagement to increase opportunities for all individuals to have a successful start in life and to foster healthy human development, and to provide programs that meet the demands of the 21st century.

While CEHD faculty and staff conduct research in over 100 fields, four key research initiatives have been identified by the college, they are: 1) Educational equity and the achievement gap; 2) Autism and developmental disabilities; 3) Children's mental health and welfare; and, 4) Living better, living longer.

### College of Design

Through a unique commitment to creativity and advancing technologies, the College of Design's (CDES) mission is to lead, innovate and educate in a full range of design fields, including apparel design, architecture, graphic design, interior design, landscape architecture, product design, and retail merchandising.

CDES research focuses ongoing and emerging issues, explore new knowledge, and address and solve real-world problems; all while adhering to socially responsible, sustainable principles, and collaborative design thinking. Recent research focuses have included apparel design and wearable technologies that help improve mental and physical well-being, accessible and sustainable architecture and interior design and rural revitalization projects.

### Assumptions

**Stable Funding:** Projections for this plan of work assume stable funding from county, state and federal resources; however, cuts in state allocations to the University of Minnesota may require the dean of Extension and the director of the Agricultural Experiment Station to decrease budgets. Key decisions will be made based on strategic planning to support the most critical issues identified.

**Fluidity of Funding:** To stay relevant, Extension and the MAES must address emerging issues as they arise. These efforts may require reallocation of funds from existing funds. More often, it will necessitate raising funds from other resources to carry out special initiatives and to hire new staff.

**Changes in Leadership:** In 2019, the University of Minnesota and the State of Minnesota acquired new leadership. As the direction of those leaders is revealed, new initiatives or directions may have an effect on the focus of education and research at Extension and the MAES.

## 2. FTE Estimates

Year	1862 Extension	1862 Research
2021	234.3	249.1
2022	234.3	249.1
2023	234.3	249.1
2024	234.3	249.1
2025	234.3	249.1

## II. Merit / Peer Review Process

MAES. Merit review of faculty supported by MAES funding occurs in each partner college. The process follows standards established by University policy, which states "A well-designed promotion and tenure system ensures that considerations of academic quality will be the basis for academic personnel decisions, and thus provides the foundation for academic excellence." The policy protects academic freedom and promotion of excellence. It includes evaluation of research impact, teaching and service.

Leadership development exists at University, College and Department levels to help faculty develop teaching, management and leadership skills through the tenure process. For example, CFANS instituted the Leads program to assist faculty in developing skills while building relationships within the college. CFANS' Artemesia Leadership Initiative focuses on inspiring female scientists by addressing gender-based barriers and improving leadership skills. The Office of Equity and Diversity offers training on diversity and inclusion and each partner college has an Office of Equity and

Diversity to expand on these issues.

The merit review process for projects selected for MAES funding is under the direction of partner college deans and varies by college. In the Department of Family Social Science, tenured and tenure-track faculty prepare proposals for MAES funding. Funding is shared among approved MAES projects. Peer review takes place at the department level with oversight from MAES leadership. Three reviewers are required for each project (two internal; one external). Reviewers submit a project proposal to the PD and department head for revisions. Once approved, proposals are sent for approval by the MAES Deputy Director before being sent to NIFA for review via REEport.

Extension has a merit review process for local and regional Extension educators and for Extension specialists, with attention to educational outcomes, scholarship and outreach. To support transparency, applicants are provided past promotion dossiers that align with expectations. Criteria for promotion is articulated, indicators of success are provided, and an appeal process is described. Peer groups assist staff through the process. Staff who have navigated the process are assigned to mentor those new to the process.

Reviewers consider seven criteria for promotion: 1) leadership; 2) teaching; 3) management; 4) scholarship; 5) technical assistance; 6) engagement; and, 7) service. Criteria are weighted differently for Extension educators with rank (regional) and those without rank (county). Candidates choose an emphasis from among the criteria. Dossiers are reviewed by Minnesota peers and colleagues in other states. The ultimate decision about promotion rests with Extension's dean, based on recommendations from a review committee, center associate deans and the senior associate dean. Decisions are made without regard to race, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status or sexual orientation. Tenure is not granted, but staff is recognized for attaining higher academic rank.

### **III. Stakeholder Input**

#### **1. Actions to Seek**

The University of Minnesota strives to maintain the confidence and trust of the people, organizations and communities it serves in all regions of Minnesota. Extension and MAES listen and are flexible and creative in selecting research and designing programs, collaborating with a wide range of diverse Minnesotans to assert the position that the University of Minnesota is "Driven to Discover" and to make a difference.

Formal structures currently in place will be maintained and will be influenced by key stakeholders, including county Extension committees, citizen committees of the Regional Sustainable Development Partnerships, the dean's Citizen Advisory Committee, and partnerships with the Association of Minnesota Counties. Programs and centers, to varying degrees, manage structured advisory committees and feedback processes. These are designed to respond to current concerns. Special initiatives to listen and respond to stakeholders will be highlighted yearly.

One key example in recent years has been the state-funded initiative called Agricultural Research, Education, Extension, and Technology Transfer Program (AGREETT). AGREETT is providing an opportunity to gather stakeholder feedback on the most important issues affecting the state. The program includes an advisory panel made up of industry representatives, University leaders and Minnesota Department of Agriculture experts working together to determine the most important challenges facing Minnesota agriculture and, therefore, what experts to hire.

#### **2. Methods to Identify**

Extension. Program teams identify stakeholders who inform program logic models and designs. Program participants provide formal and informal feedback. Program evaluation and feedback engages participants and sponsors who speak to whether Extension programs are relevant and successful. To engage new populations, program teams form relationships with organizations and formal and informal leaders in those communities. Contacts provide names of other individuals and organizations who provide Extension with information and feedback. To become relevant for different cultures and communities, Extension stands ready to change logic models, curricula and staffing.

Minnesota counties structure memorandums of understanding that address local concerns. County Extension committees are convened in each of Minnesota's 87 counties, as required by the State of Minnesota statute. Extension regional directors recruit Extension county committee members who are involved in issues addressed through Extension programs. Counties conduct yearly budget reviews, assess whether Extension programs are addressing critical needs, and consider relevance to county priorities. A committee convened by Extension and the Association of Minnesota Counties also serves in an advisory capacity.

Statewide advisory committees and elected officials inform Extension leaders. Members of a statewide Citizen Advisory Committee are selected by the dean of Extension after outreach to stakeholders who apply to be a delegate. The full committee represents the breadth of Extension's program areas and geographic concerns. Extension's government relations staff conduct regular conversations with elected officials. The goal is to communicate the value of Extension, and to learn whether Extension is addressing issues of relevance.

Regional Sustainable Development Partnerships (RSDPs) formally connect community needs to Extension resources and the University of Minnesota. RSDPs leverage volunteers for governing boards, workgroups and projects that tie community concerns for sustainable living. These are identified through partnerships with organizations and jurisdictions at the local level.

MAES.

1) MAES partner colleges have advisory committees; 2) Research and Outreach Centers' citizen advisory committees meet yearly. Listening sessions solicit input into research needs and engage with stakeholders; 3) Researchers and research teams receiving MAES funding seek stakeholder feedback and support to research programs; and, 4) Legislators and higher education committees are identified by University Relations and the government relations department.

### **3. Methods to Collect**

Extension.

Program teams. Program participants provide feedback through post-event surveys. Formal and inform evaluation, through longitudinal outreach to program participants and program sponsors, collects honest feedback about whether Extension program activities continue to be relevant and successful in meeting goals. To build trust and knowledge with stakeholders from underserved populations, Extension listens in order to learn about the needs and strengths of those communities, considering how Extension programs can change to be useful to those communities. By deciding whether or not to partner with Extension or participate in programs, program audiences "vote" on the relevance and effectiveness of programs. Educators and researchers who are liaisons to stakeholders provide internal focus groups to share what they learn in program discussions and planning. Regular review of program activities and feedback from stakeholders about programs allow program teams to identify new individuals and groups that can help them achieve their goals.

Counties: County-based committees and elected officials meet with regional directors as they make budget recommendations and decisions. Often, these budget decisions respond to the quality and relevance of the service they receive from local Extension staff. County committees receive regular communications from Extension staff.

Statewide: Through personal meetings with legislators and higher education committees, Extension monitors whether the goals of the State of Minnesota and its voters are being served. The Extension Citizen Advisory Committee is convened three times a year and receives conference calls and informational reports.

Regional Sustainable Development Partnerships: 9) RSDPs partner with organizations and agencies that have complementary goals and project objectives. Through cooperation and collaboration, RSDP increases the visibility of meetings, events, projects and opportunities such as community forums; and, 10) RSDPs have established online Idea Briefs that allow communities, organizations and individuals to submit project ideas and requests to the University of Minnesota online. RSDP manages formal proposal processes, as well, where outreach to the public generates interest in submitting ideas to RSDP.

MAES. 1) Colleges receiving MAES funding have advisory groups who provide input into research goals and needs; 2) Individual departments convene stakeholder groups specific to their disciplines, and researchers connect with stakeholder groups in a variety of ways for continuing feedback on their research goals and objectives; and, 3) Specific efforts to convene groups for new emerging research challenges, such as seeking input into renewable energy research goals and fighting invasive species, are continuously undertaken by the MAES, research centers and partner college leadership.

### **4. How Considered**

Extension.

Stakeholder input guides program teams as they design research and education, outreach and staffing. Stakeholder input answers questions such as: 1) Which audiences should educators work with? 2) Which partners are trusted? 3) How

should education be delivered? 4) What resources do stakeholders turn to? Do these resources need research-based information? 5) Has past education and research been satisfactory? 7) What new research guides program delivery? 8) What external factors require changed strategies?

County budget directives and feedback influence decisions about: 1) Staffing allocations and qualifications; 2) Use of regional educators to provide county programs; 3) Terms of memorandums of understanding; and, 4) Local partnerships.

Statewide advisory committees and government relations inform the dean's office in strategic planning, terms of memorandums of understanding, public relations, budgeting and requests for external funding.

Regional Sustainable Development Partnerships use feedback from volunteers and groups to identify University resources that address stakeholder priorities. Regional boards allocate budgets to projects they feel are most relevant.

As Extension has established program specialization, regional centers, and county memorandums of understanding, stakeholder input is deeply integrated into organizational decisions. The extent to which programs continue and evolve relies upon feedback from stakeholders and demonstrated impacts.

MAES.

Stakeholder input is important for shaping MAES supported research priorities. Insights, collected both formally and informally, lead to key hiring decisions as well as priorities for research projects that receive funding.

One example is the Rapid Agricultural Response Fund (RARF), a biannual fund provided by the State Legislature that provides funds to help with emerging issues affecting Minnesota agriculture and natural resources. RARF project proposals are reviewed by industry stakeholders, University experts and MAES, College and Extension leadership before being approved for funding. Stakeholder preference is a key component for approval.

Another example has been a shift to take research beyond discovery and into questions of how research affects the world. This focus has led to interdisciplinary research teams and collaborations, including an initiative to engage with Minnesota's tribal nations and 1994 institutions.

## IV. Critical Issues

### 1 Crop, Plant and Food Development and Production

#### Description:

The need to feed a growing population while preserving the environment is a key concern of the field of agriculture today. In Minnesota, crop and landscape plant industries contribute to the rural and state economy. The University of Minnesota focuses on improving productivity, profitability and environmental stewardship.

Research and Extension are committed to:

1) Addressing pest and weed resistance for production, profitability and sustainability; 2) Helping farmers preserve soil health and use fewer inputs; 3) Identifying emerging trends and supporting agriculture niche markets; 4) Harnessing the power of computational analytics to improve production, profitability and sustainability (i.e. G.E.M.S. Platform); and, 5) Utilizing new techniques for breeding and genetic improvements.

**Term:** Long

#### Science Emphasis Areas

Agroclimate Science  
Bioeconomy, Bioenergy, and Bioproducts  
Environmental Systems  
Family & Consumer Sciences  
Food Safety  
Human Nutrition  
Sustainable Agricultural Production Systems



## 2 Integrated Animal Systems

### Description:

Minnesota's livestock industry includes dairy, poultry, swine and horse farms throughout the state. The University of Minnesota focuses on increasing the sustainability, profitability and quality of care across the livestock industry.

Research and Extension are committed to:

1) Developing new vaccines and disseminating management practices to improve animal wellbeing; 2) Tracing how animal diseases spread, developing biosecurity recommendations, and disseminating best practices for systems that ensure the health and safety of livestock products; 3) Studying and disseminating systems for manure management and for tapping new markets; and, 4) Exploring how pathogenic microbes and bacteria affect animal health.

**Term:** Long

### Science Emphasis Areas

Agroclimate Science  
Bioeconomy, Bioenergy, and Bioproducts  
Environmental Systems  
Family & Consumer Sciences  
Food Safety  
Sustainable Agricultural Production Systems

## 3 Water Resources and Quality

### Description:

Renowned as the Land of 10,000 Lakes and the headwaters of the Mississippi River, Minnesota's waters are critical to the state's identity and economy. The University of Minnesota focuses on improving the health and biodiversity of lakes, rivers, streams and wetlands throughout the region.

Research and Extension are committed to:

1) Using precision agriculture to optimize profitability and minimize non-point source pollution in watersheds; 2) Assisting with the control and management of aquatic invasive species; 3) Ensuring Minnesotans have access to safe drinking water; and, 4) Informing urban land use decisions, improving stormwater practices and educating local leaders and water resource professionals.

**Term:** Long

### Science Emphasis Areas

Agroclimate Science  
Bioeconomy, Bioenergy, and Bioproducts  
Environmental Systems  
Family & Consumer Sciences  
Sustainable Agricultural Production Systems

## 4 Natural Resource Management

### Description:

Minnesota is home to one of the most biodiverse land systems in the U.S. Minnesota's forests provide timber, wildlife habitat, recreation, wilderness and biodiversity to the state. The University of Minnesota focuses on improving environmental conservation across the state.

Research and Extension are committed to:

1) Providing information to improve forest management and prairie restoration; 2) Controlling invasive species and protecting wildlife habitats on both public and private land; 3) Exploring ecology and how the whole system is affected by changes in climate and land management; and, 4) Increasing environmental stewardship and harnessing the power of citizen scientists to collect data and spread information.

**Term:** Long

**Science Emphasis Areas**

Agroclimate Science  
Environmental Systems  
Sustainable Agricultural Production Systems

**5 Sustainable Energy and the Bioeconomy**

**Description:**

Minnesota is currently on track to meet renewable energy goals as the state continues to diversify its renewable energy landscape and bioeconomy. The University of Minnesota focuses on developing system-wide solutions that look at not only the output but inputs as well.

Research and Extension are committed to:

1) Exploring new methods to produce biomass, biofuels and other forms of renewable energy; 2) Analyzing the supply-chain of existing and new renewable energy technologies and processes; 3) Discovering best practices to reduce overall energy usage at home, on the farm and in business; and, 4) Connecting individuals and communities to clean energy projects (CERTS).

**Term:** Long

**Science Emphasis Areas**

Bioeconomy, Bioenergy, and Bioproducts  
Environmental Systems  
Family & Consumer Sciences  
Sustainable Agricultural Production Systems

**6 Health and Nutrition**

**Description:**

Minnesota's poverty rate is low, but statistics mark some of the largest health and economic disparities in the country. The University of Minnesota focuses on making systemic changes that promote the health and wellbeing of Minnesotans.

Research and Extension are committed to:

1) Addressing family and community systems to support food knowledge, accessibility and affordability; 2) Addressing relationships between diet, nutrition, physical activity and human disease; 3) Developing methods to help the food infrastructure provide safe and healthy food that people desire; and, 4) Addressing critical issues affecting physical and mental health; e.g., drug/alcohol abuse, aging, economics.

**Term:** Long

**Science Emphasis Areas**

Education and Multicultural Alliances  
Family & Consumer Sciences  
Food Safety  
Human Nutrition  
Sustainable Agricultural Production Systems

## 7 Resilient Communities and Economies

### Description:

External forces such as globalization and demographic shifts can't be controlled, but local responses can. Resilient communities grow local leadership, plan for a sustainable future and support local businesses.

Research and Extension are committed to:

1) Informing community and economic development decisions; 2) Examining issues affecting communities and economies in Minnesota and the world; 3) Strengthening the confidence and competence of leaders; 4) Helping local decision-makers strengthen civic engagement; and, 5) Educating businesses, especially in the volatile agriculture and tourism sectors.

**Term:** Long

### Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts  
Environmental Systems  
Family & Consumer Sciences  
Sustainable Agricultural Production Systems

## 8 Building Strong, Resilient Families

### Description:

Resilience is the process and outcome of successfully responding to stressful experiences. Families under stress can improve resiliency through access to high-quality education and skill development that improve long-term outcomes.

Research and Extension are committed to:

1) Supporting stressed families through collaboration with trusted systems; 2) Providing parent education that builds resilience in families; 3) Developing financial literacy education that is accessible to low-income families; 4) Examining new family dynamics, trends and conditions; and, 5) Being responsive to current issues facing families.

**Term:** Long

### Science Emphasis Areas

Education and Multicultural Alliances  
Family & Consumer Sciences  
Youth Development

## 9 Youth Development

### Description:

Of the million young people living in Minnesota, 35 percent are under-engaged in enrichment experiences and 40 percent report not having a meaningful connection to a caring adult in their community. Many of these youth, of every age, gender, race, socio-economic status, religion and family type, are not on a positive pathway.

Research and Extension will:

1) Give youth places to learn, lead and build connections; 2) Expand programs so that more youth have the confidence, resilience and compassion they will need as they become adults; 3) Train youth-serving organizations and teachers in best practices using a research-based approach; and, 4) Collaborate with community partners to ensure that Minnesota's youth build the skills they need to thrive.

**Term:** Long

**Science Emphasis Areas**

Education and Multicultural Alliances

Family & Consumer Sciences

Youth Development

**10 COVID-19 Response and Recovery**

**Description:**

The COVID-19 pandemic is affecting the nation's food and agricultural systems from production to consumption. There is an immediate need to develop and deploy rapid, reliable, and readily adoptable strategies across the food and agriculture enterprise to help mitigate the impact of the pandemic, aid in post-pandemic recovery, and develop protocols to help limit the impact of future threats to public health.

Research and Extension will:

1) Enhance and fill knowledge and information gaps related to COVID-19 and how it is, and could affect the food and agricultural industry and the mental and physical health of Minnesotans; 2) Develop best practices, models, diagnostic tests, and personal protective equipment that will help ensure the safety of food and food service workers; 3) Catalog the economic impact of COVID-19 in Minnesota and develop strategies and models to mitigate the impact on rural Minnesotans and small-scale producers; and, 4) Provide timely education that supports adaptation to new conditions at home, in communities, in businesses, and on farms.

**Term:** Short

**Science Emphasis Areas**