

The Center for Agroforestry

at the University of Missouri

A Global Center for Agroforestry, Entrepreneurship and the Environment



Road Map 2020: A Visioning Document for the Next Decade



The Center for Agroforestry
University of Missouri

A Global Center for Agroforestry, Entrepreneurship and the Environment

Table of contents

	Page
Foreword	3
The Strategic Road map — Methodology	4
Current Situation	5
History	5
Resources	6
Personnel	6
Core and associated research facilities	7
Research Program	8
Core research program	8
Affiliated research programs	8
Research productivity metrics	9
Research impacts	10
Research SWOT analysis	11
Technology Transfer Program	13
Current initiatives	13
Current collaborators	13
Technology Transfer productivity metrics	14
Technology Transfer impacts	15
Technology Transfer SWOT analysis	16
Teaching/Educational Program	18
Current teaching/educational program	18
Teaching/educational productivity metrics	18
Teaching/educational SWOT analysis	19
Strategic Vision	20
The Strategic Road map	21
Appendix A: Report on Center's outcomes	27

Foreword

The Center for Agroforestry at the University of Missouri (UMCA) is one of the premier centers of its kind in the world dedicated to agroforestry research, teaching and technology transfer.

Our mission is to support the long-term future of rural and urban working farms and forests by achieving economic, environmental and social sustainability. The Center's long-term research, teaching and technology transfer efforts help make a better Missouri, U.S. and world by (1) discovering, integrating and applying new agroforestry knowledge and technologies to promote economic, environmental and social vitality; and (2) educating and training students, professionals, scientists, leaders and general public who are empowered to make a difference locally, regionally, nationally and globally.

Our strength lies in the 22 core Center faculty and staff, over 50 associated faculty, staff and external collaborators, and over 20 graduate students and postdoctoral research associates who define, design and carry out more than 70 research and technology transfer projects. We also find strength in our diverse clientele base and friends who believe in agroforestry as a major form of future global land use.

This document is a vision of what UMCA is and can be. It is the result of the collaborative effort of faculty and staff during five planning meetings and the feedback provided by our main stakeholders. It is a statement about where we are now and where we intend to go next. With this strategic plan, we hope to build on our past successes and bring new dimensions and a new vision to our programs in the next 10 years.

Thank you for partnering in this effort!

*Shibu Jose, Ph.D., H.E. Garrett Endowed Professor and Director,
The Center for Agroforestry at the University of Missouri*



Dr. Shibu Jose, **Director**
The Center for Agroforestry

The Strategic Road map — Methodology

The Strategic Road map process is a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is and what it does, with a focus on a predetermined future. It is a management tool that will help an organization focus the energy of its employees and collaborators towards common goals. It is also a tool used to assess and clarify the organization's direction and response to changing environments.

Developing the Strategic Road map

The Center's leadership organized five faculty/staff meetings to work towards the road map creation.

Planning started with the assessment of the current situation. The external environment along with current metrics were evaluated, and strengths, weaknesses, opportunities and threats were identified for each main area of activity (research, technology transfer/outreach and teaching/educational).

Faculty and staff provided comments during the meetings that were used to formulate the Center's vision, mission and strategic priorities. The draft plan was run through the Center's main stakeholder representatives who provided insightful comments used to finalize the plan.

Implementing the Strategic Road map

To convert its vision into reality, strategic goals, objectives and specific actions were identified. A lead group was identified for each main group of strategies. The lead group is expected to involve other appropriate constituents during the implementation process and to identify measurable outcomes of their activities. To strengthen accountability for outcomes, performance review forms and the annual review report format will be re-evaluated to include performance measures that will help track progress of the measurable outcomes.

Monitoring the Strategic Road map

A frequent assessment of progress is necessary to ensure objectives are achieved in a timely manner and progress is being made towards achieving the vision. Performance measures will be tracked on the form presented in Appendix A. After the Annual Review Meeting in January of each year, an Advisory Board and a formal faculty/staff meeting will be organized to review progress and make changes to the process and objectives. Correction(s) will be made as new information becomes available or new opportunities or threats develop.

Current Situation

The Center for Agroforestry at the University of Missouri (UMCA), established in 1998, is one of the world's leading centers contributing to the science underlying agroforestry.

Interdisciplinary collaboration is one of the outstanding hallmarks of the Center. Research on the benefits of agroforestry is supported from a broad spectrum of disciplines: forestry, fisheries and wildlife, entomology, plant pathology, agronomy, animal science, horticulture, soils, atmospheric science, agricultural economics and rural sociology. Linked with the Center's solid science and research programs are several key collaborations and partnerships with landowners, natural resource professionals, federal and state agencies and non-profit organizations. Through these critical relationships, UMCA and its partners are producing an expanding list of positive outcomes for landowners, the natural environment and society as a whole.

History

- 1975-1993:** Gene Garrett initiates alley cropping research with black walnut at Sho-Neff farm of Hammons Products Company, Stockton, Mo., (with Marc Linit, Monty Kerley, Jack Slusher, Felix Ponder, Jerry van Sambeek). Paired watershed study initiated at Novelty with Garrett and Gray Henderson (1991). 1991 host 2nd North American Agroforestry Conference at Springfield/Stockton.
- 1993:** Small “c” Center for Agroforestry formed. First ARS SCA’s funded. Center joins forces with Horticulture Research Center; renamed Horticulture and Agroforestry Research Center.
- 1993-1998:** Technology Transfer program coordinator hired. First tree improvement specialist hired. Multiple research projects initiated at HARC (RPM study, pine/walnut study, nut tree cultivar studies), scope and breadth of Center research broadens. All nut tree research studies initiated by Ken Hunt.
- 1998:** Big “C” Center for Agroforestry established. \$2 million/year EPA Agroforestry Floodplain Initiative funding awarded. National Agroforestry Center and Iowa State University subcontract with Center to work on riparian buffer research in Missouri.
- 1998-2001:** EPA Program Coordinator hired. Economist hired. Scope of Center research expands dramatically, research collaborations expand to include USFS, ISU, NAC. Flood and Shade Tolerance Labs constructed at HARC. Annual Research Reviews begin; Mike Gold assumes Associate Directorship.
- 2001:** \$2 million/year funding shifts from EPA to ARS in collaboration with Dale Bumpers Small Farms Research Center, Booneville, Ark.
- 2001-2009:** ARS funding continues, Senior Information Specialist, Events Coordinator, Marketing Research Specialist hired. Doug Allen bequeaths 500+ acre Allen Farm in Laurie, Mo., to Center; also funds establishment of endowed chair in agroforestry.
- 2009:** ARS funding shifts to NP216 – Agricultural System Competitiveness and Sustainability “Economic and Environmental Benefits from Multiuse Agricultural Landscapes to Family Farms.” Center hosts 11th North American Agroforestry Conference in Columbia, Mo. Gene Garrett retires; Shibu Jose hired as Director.

Resources

Personnel

The 22 core faculty and staff, 49 associated faculty, staff and external collaborators, and over 20 graduate students and postdoctoral research associates work towards accomplishing more than 70 research and technology transfer projects.

Core personnel at UMCA	22	Affiliate personnel	49
		Faculty, MU	
		Faculty, MU	6
• Faculty (Ecology, Entomology, Economics & Marketing, Soil & Water Quality, Molecular Mycology, Genetics & Tree Improvement, Phytoremediation & Phytochemistry)	8	MU, Forestry	6
• Research Associate	6	MU, SEAS (Soil, Environmental, and Atmospheric Sciences)	4
• Research Specialist	7	MU, Fisheries & Wildlife	2
• Administrative Associate	1	MU, Entomology	1
		MU, Horticulture	3
		MU, Agronomy	3
		MU, Plant Sciences	1
		MU, Parks, Rec. and Tourism	1
		MU, Plant Pathology	1
		MU, Agricultural Economics	1
		MU, Rural Sociology	1
		External Collaborators	
		USDA ARS	6
		USDA NRCS	2
		USDA Forest Service	8
		Missouri Dept. Conservation	1
		Univ. St. Louis	1
		Kansas State Univ.	1
		Iowa State Univ.	2
		Univ. of Notre Dame	1
		Lincoln Univ.	1
		Westminster College	1
		Jefferson Institute	1

UMCA core and associated research facilities

UMCA's agroforestry research efforts are centered around the outlying university research properties, with a focus on ongoing agroforestry research and landowner demonstrations in adjacent locations complimented by socio-economic studies.

Horticulture and Agroforestry Research Center (HARC), 655 acres, New Franklin, Mo. Studies include specialty crops including nut trees, pawpaw, silvopasture, forest farming including pine straw and truffles, and upland buffers on grazed pastures.



Southwest Center, 893 acres, Mt. Vernon, Mo. Studies include specialty nut and fruit crops including pecan, black walnut, elderberry, black cohosh.



Wurdack Farm, 1,217 acres, Cook Station, Mo. Research focus on Ozark silvopasture, including hardwoods (white oak) on north-facing slopes and softwood (shortleaf pine) on south-facing slopes.



Greenley Research Center, 700 acres, Novelty, Mo. Studies include long-term paired watershed study of upland agroforestry and grass buffers on non-point source pollution amelioration.



Allen Research and Education Farm, 535 acres, Laurie, Mo. Studies include wildlife habitat improvement, warm season grass and prairie restoration, forest management, production of nut trees, non-timber forest products.



Newport Farms, 18 acres, Novelty, Mo. Study on windbreaks for odor control around confined animal feeding operations.



Mark Twain Watershed, 1.47 million acres, northeastern Missouri. Studies focus on non-point source pollution and wildlife impacts of riparian forest buffers.



Research Program

Core research program

Economic, Social and Environmental Benefits from Multiuse Agricultural Landscapes to Family Farms

Objective 1: Determine the agricultural goods (e.g., crops, biomass), and ecosystem services (e.g., habitat) derived at field, farm and landscape scales.

Objective 2: Develop strategies to integrate trees and grazing livestock into existing grasslands, and grasses and grazing livestock into forest stands.

Objective 3: Develop conservation practices to manage the fate and transport of sediments, nutrients, antibiotics and pathogens from agricultural inputs including synthetic fertilizer, herbicides, grazing livestock manure and applied poultry manure.

Objective 4: Develop optimal strategies integrating economic agricultural production and natural resource stewardship for diverse landscape positions (e.g., grasslands, woodlands, uplands, lowlands, riparian areas) across the Lower Midwest and South Central regions.

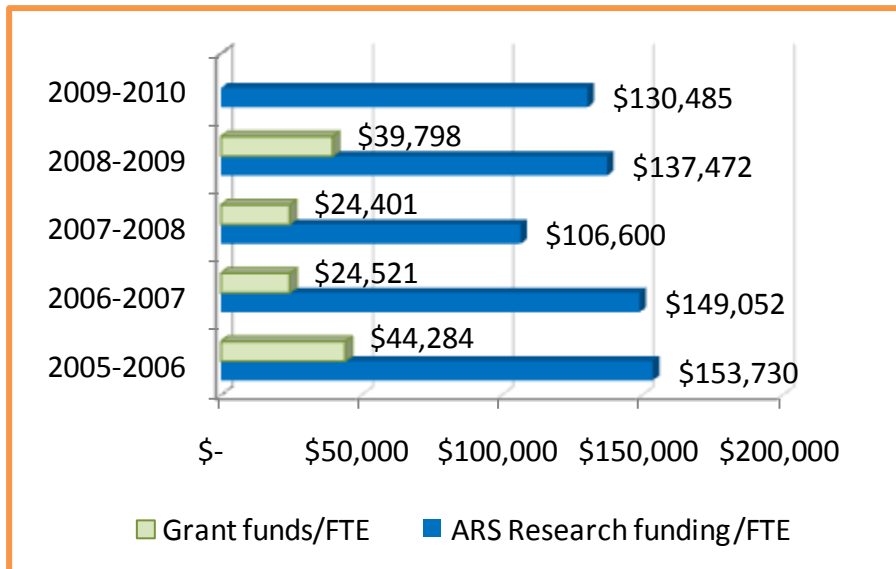
Affiliated research programs

- Flood tolerance research
 - Enhance morel fruiting in targeted wooded locations.
 - Identify superior genotypes of Pitch x Loblolly (*Pinus rigida x taeda*) and Loblolly (*P. taeda*) pine in terms of cold hardiness, needle characteristics and needle yield for pine straw production.
 - Screen phytochemicals from Eastern redcedar (*Juniperus virginiana*) for their antimicrobial, anti-melanoma, antifungal or herbicidal efficacy leading to development of potential new phytochemical industry applications.
 - Above- and below-ground interactions between trees and crops, including insect predator/prey dynamics.
 - Develop and test the potential for increased use of northern pecan, black walnut and chestnut.
 - Evaluate American elderberry as a viable agroforestry/horticultural crop in the Midwest.
 - Evaluate performance of pawpaw cultivars at four Midwestern locations.
 - Phytoremediation of explosives.
-

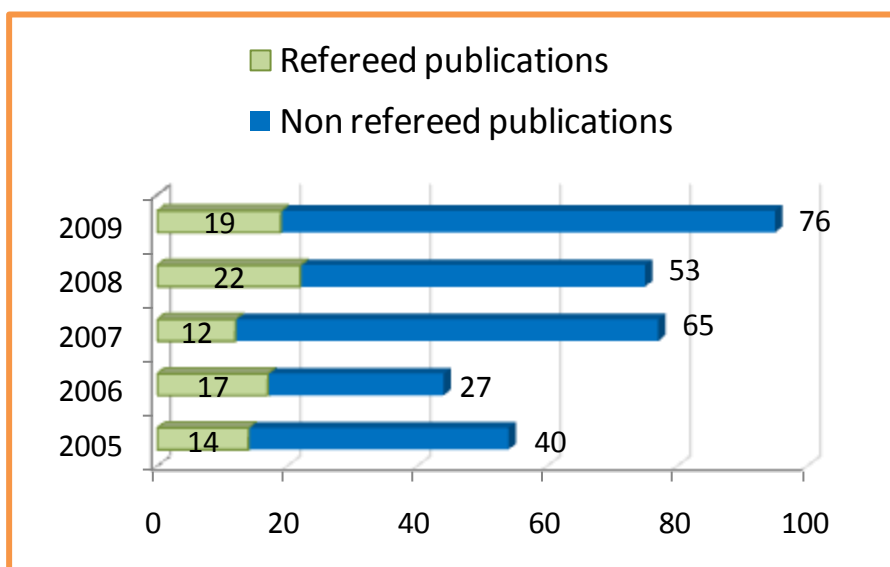
Research Productivity Metrics

Research funding per research FTE (full-time equivalent) measured as funding received for the core research programs sponsored by ARS and external grant funds attracted by UMCA researchers.

FTE=12.65.



The number of publications by UMCA researchers (in refereed and non-refereed publications) over the past five years.



Research Impacts

The major goal of The Center for Agroforestry at MU is to support the long-term future of the family farm and forests and play a part in the revitalization of rural and urban communities and landscapes. The Center's long-term research efforts focus on two major themes: (1) Providing scientific evidence that documents many of the environmental benefits of agroforestry practices (e.g., improving soil, water and air quality); and (2) Demonstrating the viability of niche crop production to augment the economic opportunities on the family farm.

With long-term financial support from the USDA Agriculture Research Service (ARS), multiple short-term research grants, along with a host of public and private partnerships, the Center continues to make impressive strides as a leader in the science and practice of agroforestry.

Environmental impacts

Across the nation, commercial agriculture is under pressure to mitigate the environmental impacts from farming (i.e., livestock and crop production). The Center for Agroforestry at MU is a national leader in the development of vegetative environmental buffer technologies to reduce nonpoint source pollution (e.g., atrazine, veterinary antibiotics, sediment, nitrogen, phosphorus, etc.). Direct impacts from the application of our research includes addressing the issues of surface and ground water quality (e.g., hypoxia in the Gulf of Mexico; drinking water quality, etc.) and air quality in association with commercial agriculture (e.g., confined animal feeding operations).

Rural development/alternatives for the family farm

The Center for Agroforestry at MU is a national leader in development of specialty crops for alternative income sources on the family farm including northern pecan, black walnut, Chinese chestnut, elderberry, gourmet mushrooms, species for bioenergy production, etc. In 1995, research was initiated to develop genetically improved cultivars of northern pecan, black walnut and chestnut as new specialty crops for growers in Missouri and the Midwest. Fourteen years later (2009), the Center is on the cusp of launching new, profitable, locally-based nut industries in the Midwest region. To launch a new nut crop industry, nut tree improvement activities (e.g., breeding and selection) are essential. Currently, the Center for Agroforestry has the largest germplasm repository and genetic improvement program for eastern black walnut and Chinese chestnut in the U.S. – two species poorly represented in the ARS National Plant Germplasm System. The Center also maintains a large germplasm repository of northern pecan.

Research SWOT Analysis: Strengths and weaknesses

Strengths	Weaknesses
<ul style="list-style-type: none"> • Reputation of the Center (in state, national, international). • Collaboration across disciplines; Numerous partnerships (ARS, ISU, etc.) • Environmental dimensions of agroforestry: <ul style="list-style-type: none"> • Water and soil quality • Non-point source pollution • Phytoremediation for fertilizer, herbicide, antibiotics, explosives • Air quality • Production dimension of agroforestry: <ul style="list-style-type: none"> • Specialty crop production research (pecan, walnut, chestnut, shiitake, elderberry, paw-paw, pine straw, truffle) • Socio-economic/marketing/consumer research <ul style="list-style-type: none"> • Chestnut, shiitake, redcedar • Landowner surveys • Comprehensive research farm (HARC) with unique features such as flood lab and other research farms such as Wurdack, Greenley, Southwest Center, Bradford • Unique opportunity to conduct research at the Allen Research and Education Site (if additional financial resources come online) • Investment in long-term research • Methods and technology development 	<ul style="list-style-type: none"> • Lack of permanent funding (we are working on this) • External grant success (to date) (need to capitalize on everything we do have) • Inability to find dollars to compete when federal match is required • Limited integrated research/demonstration at the system level (limited to entomology systems work to date) • Limited economic impact (to date) • Wildlife research program • Organic research program (none to date) (missed opportunity) • Limited graduate/postdoctoral support • Loss of key MU and Center researchers and support staff (salary issues) • Refereed publications, especially considering funding levels • Limited land base at HARC • Lack of communication about projects, among colleagues and between PIs and research specialists • Need to integrate studies across state • Engineering expertise; grant proposal facilitator • Limited implementation of agroforestry practices by landowners

Research SWOT Analysis: Opportunities and Treats

Opportunities	Threats
<ul style="list-style-type: none"> • Biomass energy • Specialty crops organics/agroecology/ systems • Health/nutrition/phytochemistry related (elderberry, nuts, redcedar) • Private sector support • Foundation support • Funding for partnerships and new collaborators to increase scope and scale both domestically and internationally • External funding for graduate student and postdoctoral support • Opportunities for international collaboration • Patents to bring in royalties (We should be more directly involved in trying commercialize our discoveries rather than giving away the store to “MU” or some private entity) • New funding priorities at federal and state level; ex: NIFA emphasizing integrated research projects, for which UMCA is well set-up • Make studies large enough to superimpose other studies; opportunities for additional funding • Opportunity to establish a national germplasm repository for eastern black walnut • Opportunity to get involved in the USDA NRCS Mississippi River Basin Initiative • Opportunities to establish trials on university and private farms 	<ul style="list-style-type: none"> • Loss of ARS core funding • Ever-increasing competition in federal grants • MU’s indirect cost requirements • SCRI — not realistic to look at SCRI as a funding sources as a result of matching requirements • Lack of incentives/pressure to look for external funding

Technology Transfer/Outreach Program

The UMCA Technology Transfer team works side-by-side with landowners, forest and farm organizations, natural resource professionals and extension agents from across the state and the Midwest through on-site consultations, educational workshops, publications, newsletters and educational exhibits.

Current initiatives

- UMCA website
- Missouri Chestnut Roast festival
- Chestnut workshop series
- Agroforestry trainings for professionals and landowners throughout Midwest
- Agroforestry presentations at conferences
- Agroforestry booth as exhibit at conferences
- Information guides – Agroforestry in Action series
- Consumer guides for specialty products such as nuts
- Online training manual
- Agroforestry practices DVD
- Specialty crop market analyses
- Specialty crop financial decision models
- Newsletters: Green Horizons & The Chestnut Grower (quarterly)
- Annual Report
- Monthly e-Newsletter
- Public, media relations contacts to promote all events and to gain wider recognition for research and technology transfer accomplishments

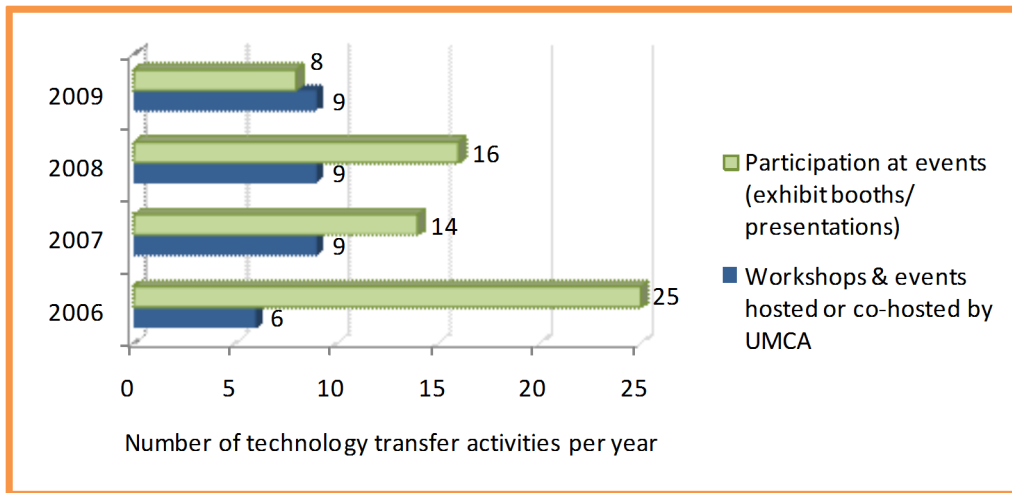
Current collaborators

- MU Faculty
 - MU Extension
 - Missouri Department of Agriculture
 - Missouri Department of Conservation
 - National Agroforestry Center
 - Natural Resources Conservation Service
 - Iowa State University
 - Kansas State University
 - Lincoln University
 - Private landowners/businesses (Ozark Forest Mushrooms, Missouri Northern Pecan Growers, Hammons Products Co., Eridu Farm, Goods From the Woods, Chestnut Charlie, Empire Chestnut, Forrest Keeling, Premium Standard Farms).
-

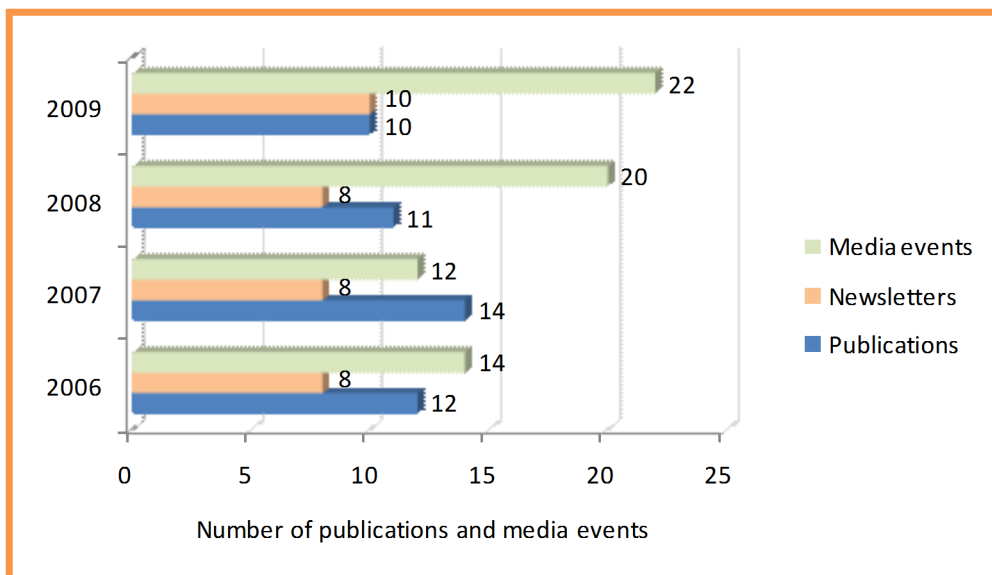
Technology Transfer/Outreach Productivity Metrics

One of the primary goals of the Center for Agroforestry is to educate and inform landowners and natural resource professionals about new research in agroforestry.

One of the ways the Center disseminates research knowledge is through educational workshops and other events. The number of technology transfer activities (participation at events and workshops) is a measure of technology transfer activity.



Publications such as Agroforestry in Action guides and marketing studies constitute valuable resources for landowners and natural resources professionals and are part of the technology transfer effort. Another important activity is getting the Center’s name out to media and the public through news releases. Monthly newsletters and the Annual Report update various stakeholders on the Center’s achievements.



Technology Transfer/Outreach Impacts

- Missouri Chestnut Roast Impact – Annual event has run for seven years. Has gained reputation as a unique family- and landowner-focused educational event that showcases local specialty crop producers and research activities ongoing at the HARC farm. Event has attracted over 20,000 attendees since its inception. Event is unique among all farm and field days at all outlying MU properties. Event is also the driver to develop Missouri’s chestnut industry for both producers and consumers.
 - Chestnut Workshops Impact – Externally funded (MDA) event geared to support the development of Missouri’s chestnut industry by training and educating current and future growers. Forty growers enrolled in 2009 workshop series (first time offered).
 - 11th NAAC Impact – UMCA hosted 11th North American Agroforestry Conference, showcased our approach and entire portfolio of activities to over 100 attendees. Extensive pre- and post-conference field tours to show “agroforestry in action” with Missouri producers.
 - Agroforestry Training Manual Impact – In conjunction with and funding from the National Agroforestry Center, UMCA created the only comprehensive agroforestry training manual for U.S. agroforestry. Over 500 copies of the training manual (hard copy and/or CD) have been distributed throughout the U.S., Canada and worldwide.
 - NCR-SARE Funded Agroforestry Training Impacts –
 - A total of 85 resource professionals participated in a kick-off training, January 2006.
 - 11 agroforestry training workshops were conducted from January 2006 - March 2009.
 - A total of 252 landowners and resource professionals participated in 10 additional trainings over 3 years.
 - A new agroforestry training manual was created and made available to all workshop participants.
 - As a direct follow up to NCR SARE-funded July 2006 workshop, \$1 million was set aside by the MO NRCS to fund Missouri’s windbreak sign up. All 120 applications to this program were offered funding totaling more than \$407,000. Twenty-seven miles of windbreak/shelterbelts will be established in Missouri due to this effort.
 - Between January 2006 and March 2009, agroforestry trainings, supported directly and indirectly by NCR SARE took place throughout the Midwest including: Missouri, Kansas, Iowa, Minnesota, Wisconsin, Illinois and Kentucky.
-

Technology Transfer/Outreach SWOT Analysis: Strengths and weaknesses

Strengths	Weaknesses
<ul style="list-style-type: none"> • Reputation of Center (at MU, in state, national, international) • Collaboration across disciplines; Numerous active partnerships (MU-E, ARS, ISU, NRCS, MDC, ...) • Many great stories to tell to many diverse audiences (stakeholder groups) • Well-established field days and other events (e.g. Chestnut Roast) • Well-established training series (e.g. Chestnut Workshop Series) • Agroforestry in Action publications are kept up to date, more under development and relevant to many diverse stakeholders • Award-winning publication series that are widely circulated (e.g. Green Horizons) • Monthly e-Newsletter • Well represented at local, state and regional professional and stakeholder meetings • Technology Transfer team already in place 	<ul style="list-style-type: none"> • Limited adoption of agroforestry practices or specialty crops (to date) – not just MO, everywhere in USA • Limited knowledge of agroforestry at all levels: Researchers, extension agents, natural resource professionals, agency administrators, politicians, private sector investors, banks/loan officers, conservation organizations, landowners, youth • Limited economic impacts (to date) • Infrequent tech transfer training programs offered • Limited enrollment in offered programs • Lack of follow-up when offer “train the trainer” education • Lack of FFA, 4H-focused education – no interest from FFA side • Need detailed list of practicing landowners

Technology Transfer/Outreach SWOT Analysis: Opportunities and Threats

Opportunities	Threats
<ul style="list-style-type: none"> • New international research/training facility at HARC • Continued development of Doug Allen property • More agroforestry demonstrations at outlying properties – who will be responsible for these? • More agroforestry demonstrations on private farms – even more problematic without Center assistance • High touch approach “peer-to-peer” • More collaboration local, regional, national • International training programs • Capacity building at international level • Social networking; ex. our Agroforestry video now available on YouTube • Hickman House draws people to HARC • Annual Extension conference can be education opportunity • MU Extension specialists available to help spread word on agroforestry 	<ul style="list-style-type: none"> • Loss of ARS core funding • ARS funding not directly in support of Technology Transfer • Loss of key MU and Center researchers and support staff (salary issues) • Erosion of Land Grant Extension throughout the U.S. (MU has suffered less than others to date)

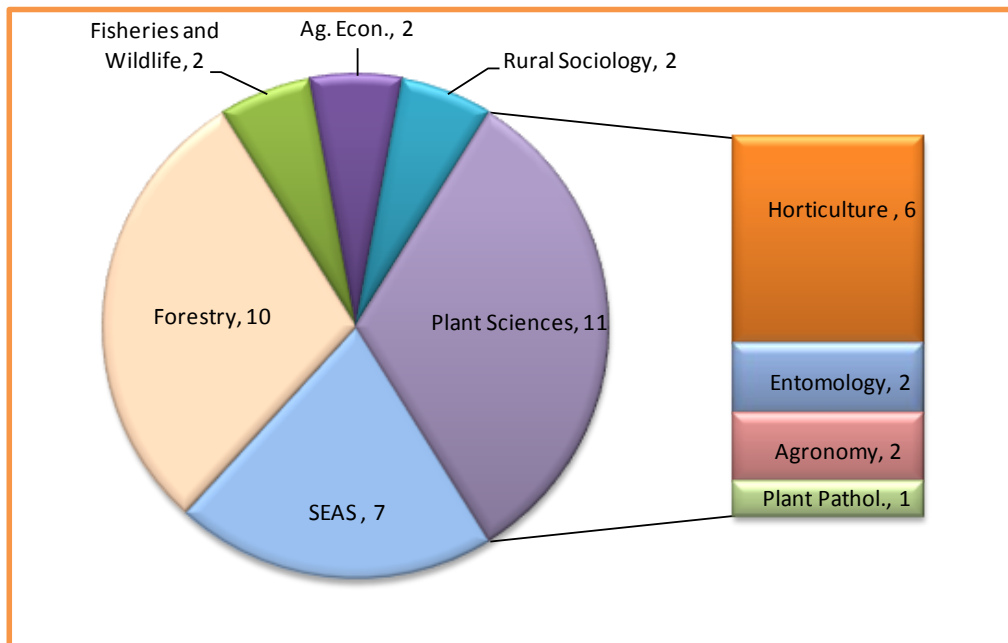
Teaching/Educational Program

Current teaching/educational program

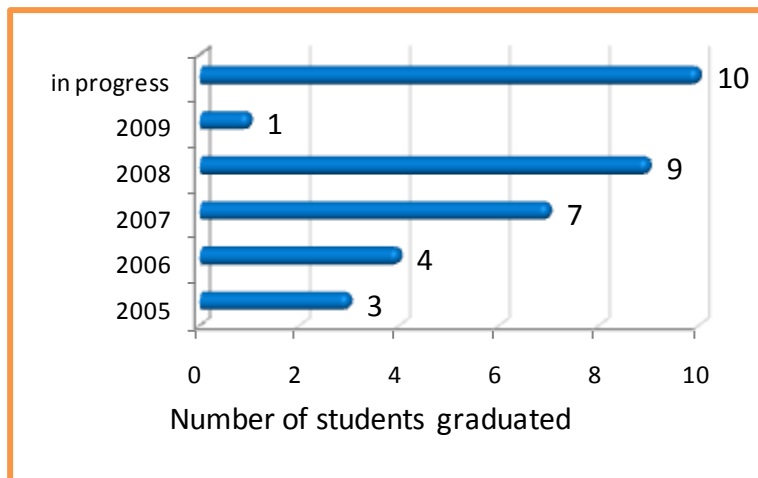
Courses offered: UMCA Director is the only individual with a teaching appointment at the Center. The course FOR 4385/7358 Agroforestry (4 credits; Fall Semester) averages 10 students per year. An online MS and Graduate Certificate are now under development.

Teaching/Educational Productivity Metrics

In the last five years, UMCA has funded a number of graduate students from different specialties.



Number of students sponsored by UMCA that obtained a degree in the last five years.



Teaching/Education SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • One of the best agroforestry graduate training programs in the world • Faculty expertise in core agroforestry disciplines • Large number of agroforestry research and technology transfer projects to complement and enrich undergraduate and graduate learning/research opportunities 	<ul style="list-style-type: none"> • Only one agroforestry course offered (offered as a dual undergrad/grad-course) – course is taught by a faculty member with no formal teaching responsibilities • Only one member of the Center faculty has a formal teaching appointment • Enrollment is low to medium
Opportunities	Threats
<ul style="list-style-type: none"> • Undergraduate emphasis area in agroforestry • More courses related to agroforestry • Online graduate education programs – Graduate Certificate and non-thesis M.S. • Enhance M.S. and Ph.D. enrollment in agroforestry • Enhance fellowship and assistantship opportunities for graduate students • Undergraduate Internship program to provide students with hands-on training in agroforestry research and practices • UMCA speakers can participate in additional MU field days across state to help educate • Add AF element to study abroad trips at MU • Can work to reach students at secondary level through guest lectures, etc. • Adjunct faculty status for ARS scientists to advise graduate students 	<ul style="list-style-type: none"> • Uncertainty in ARS funding • Assigning courses to ARS-funded Center faculty and staff is an inappropriate use of ARS funding • Decreased enrollment in natural resources programs in general • Job opportunities for agroforestry graduates

Strategic vision

Vision

To be a preeminent global center in agroforestry research, education and technology transfer with comprehensive programs that encompass ecological and economic sustainability, commodity production, environmental conservation and stewardship and integrated management.

Mission

To support the long-term future of rural and urban working farms and forests by achieving economic, environmental and social sustainability. The Center's long-term research, teaching and technology transfer efforts help make a better Missouri, U.S. and world by:

- Discovering, integrating and applying new agroforestry knowledge and technologies to promote economic, environmental and social vitality; and
- Educating and training students, professionals, scientists, leaders and general public who are empowered to make a difference locally, regionally and globally.

Philosophy

"A farm can be regarded as a food factory and the criterion for its success is saleable products. Or, it can be regarded as a place to live, and the criterion for its success is harmonious balance between plants, animals and people; between the domestic and the wild; and between utility and beauty." – Aldo Leopold

The Strategic Road map

The present Road map defines The Center for Agroforestry's vision and mission and identifies ways to execute, improve and quantify the research, technology transfer and educational activities in the next 10 years.

The Center's research agenda for the next five years is detailed in the ARS NP 216 – Economic, Social and Environmental Benefits from Multiuse Agricultural Landscapes to Family Farms. In addition to that, annual workplans detail participation in affiliated research programs. Detailed plans of action and budgets are developed each year to coordinate the research and technology transfer efforts.

To achieve the Center's vision of becoming the preeminent global center in agroforestry research, technology transfer and education, several strategic initiatives have been developed. The strategic initiatives will help discover, integrate and apply new agroforestry knowledge and technologies to promote economic, environmental and social vitality and to educate students, professionals and the public at large about agroforestry.

To support strategy creation and implementation, an Advisory Board will assist the UMCA to accomplish its mission and goals, establish priorities for research, teaching and technology transfer programs and develop effective strategies to procure public and private support including funding for programs relevant to its mission. Members of the Advisory Board will represent stakeholders, which will include private sector producers and service providers with interest in the research, teaching and technology transfer programs and/or technologies involved in the UMCA.

General strategies such as Strengthen and diversify the funding base and Strengthen partnerships apply to all activity areas: research, technology transfer and education.

The lack of permanent funding and the limited external grant success because of increased competitiveness of external grants and the difficulty to obtain grants when non-federal match is required can create disruption in Center's activity. A reliable, permanent funding base would provide stability and encourage investments in research, technology transfer and teaching activities. Additional grant funding will provide means to expand research, to recruit talented graduate and post-doctoral support and to provide competitive salaries to researchers and support staff.

UMCA recognizes the value in working with the main stakeholders. By partnering with other universities, natural resource entities, agricultural organizations and landowners across the nation, UMCA fosters an integrated approach to farming across diverse landscapes. UMCA also is seeking to enhance international collaborations especially in the area of research and teaching.

Research strategies will ensure research of higher quality, productivity and relevance is being performed. Research quality can be enhanced by setting and addressing in collaboration with the Advisory Board of clear research priorities that make sure research efforts are directed to solve actual global and local challenges that can be addressed by agroforestry by taking advantage of the existing opportunities.

Integration of the research/demonstration projects at the system level will allow studying interactions within the system and the influence of external factors, contributing to enhanced research quality.

Research results and publications contribute to the enhancement of agroforestry knowledge and participation at national and international events and help reach a large number of audiences.

As the research effort is increasing, it is very important to measure and document the impact of research: the effect of research results on the subsequent progress of knowledge (scientific impact); development of new products, processes and service (technological impact); new job creation, economic prosperity (economic impact); influence of research on welfare, behaviors, practices and activities of people and groups (social impact); and influence of knowledge on policies and policy makers (political impact).

UMCA promotes a remarkable diversity of research at various core and affiliated research facilities. The Horticulture and Agriculture Research Center (HARC), as the main research site, can benefit from more land to accommodate new research projects and from a Learning Center while Doug Allen Research and Education site will become a premier agroforestry research location.

Technology transfer/outreach strategies

To enhance the technology transfer effort, specific training programs for each stakeholder group will be developed. For example, to target mid-career professionals, an Agroforestry Academy will be created. Collaboration with extension specialists and other key stakeholders will be enhanced.

Teaching/education strategies

Formal teaching and education will target undergraduate, graduate and post graduate levels. They will increase interest in agroforestry and reach across the nation borders through participation in Peace Corps or study abroad programs.

The Road map—Strategic goals, objectives, actions and performance measures

1. GENERAL STRATEGIES			
Strategic goals	Objectives	Actions	Performance measures
	Support strategy creation and implementation	Change name to better reflect the breadth and depth of UMCA programs Form an External Advisory Board	Advisory Board by December 2010
	Obtain permanent base funding	Work with ARS to obtain permanent funding	Obtain permanent funding by fiscal year 2011-2012.
STRENGTHEN AND DIVERSIFY THE FUNDING BASE	Diversify funding sources	-Explore new funding opportunities at federal, state and private level	Total award dollars/FTE External dollars/FTE % of salary provided by external funding
		-Collaborate with on-campus grant writers to get support for grant writing/coordination	
		-Encourage grant writing training for research personnel	
STRENGTHEN PARTNERSHIPS	Strengthen partnerships	Increase collaborations and partnership opportunities with key stakeholders	Number of partners (domestic and international) Number of collaborative programs (in research, technology transfer and teaching, domestic and international)
		Establish international collaborations (collaborative research, graduate training—on campus and online)	

2. RESEARCH STRATEGIES				
Strategic goal	Objectives	Actions	Performance measures	
ENHANCE RESEARCH PERFORMANCE	Enhance research quality	<ul style="list-style-type: none"> -Set research priorities -Expand the research portfolio in concordance with the research priorities and current opportunities (e.g., wildlife, organic, biomass and bioenergy, climate change mitigation) -Integrate research/demonstration at the systems level 	<p>The Advisory Board, the Center's leadership, faculty and staff will set research priorities.</p> <p>Refereed publications/FTE</p>	
	Enhance research productivity	<ul style="list-style-type: none"> -Increase grant funding to support undergraduate internships, graduate students, research specialists and post-docs -Increase number of publications -Increase participation at national and international events 	<ul style="list-style-type: none"> -Number of graduate students (post-docs) -Total publications/FTE -Number of presentations (posters/abstracts) 	
	Enhance research relevance	<p>Measure and document the Center's research impact:</p> <ul style="list-style-type: none"> -Scientific impact (the effect of research results on the subsequent progress of knowledge); Technological impacts (product, process, service innovations – patents); Economic impact; Social impact (impact knowledge has on welfare, behaviors, practices and activities of people and groups); Political impact (the way knowledge influences policy makers and policies). 	<ul style="list-style-type: none"> -Profit generated by patents or products that result from the research -Participation of Center researchers in scientific panels 	
	Strengthen research/demonstration facilities		-Pursue opportunities to acquire more land at HARC	By 2013
			-Develop Allen Research and Education Site as a premier agroforestry research location	By 2020
			-Establish the ARS National Plant Germplasm Repository at HARC	By 2013
			-Build Research Learning facility at HARC	By 2013

3. TECHNOLOGY TRANSFER / OUTREACH STRATEGIES			
Strategic goal	Objectives	Actions	Performance measures
ENHANCE AND EXPAND UMCA'S OUTREACH TO MISSOURI, THE NATION AND THE WORLD.	Improve infrastructure	<ul style="list-style-type: none"> -Build Learning Center facility at HARC -Develop specific training programs for each stakeholder group -Begin an Agroforestry Academy for mid-career professionals -Increase quality of training programs (Offer training programs on a regular basis; Follow up after training programs); -Diversify promotion methods to increase enrollment in technology transfer programs -Increase collaboration with extension specialists -Joint Technology Transfer positions with key stakeholders -Increase cross collaboration on technology transfer and training with The National Agroforestry Center and the Mid-America Working Group. -Establish a network of agroforestry demonstration sites (link to our website) -Increase agroforestry demonstrations on outlying properties and private farms -Enhance Allen Research and Education Site technology transfer activities 	<p>By 2013</p> <ul style="list-style-type: none"> -number of events organized/sponsored by UMCA -number of UMCA-sponsored event participants -number of people reached -number of UMCA publications -number of UMCA publications distributed -number of media events
	Increase external communication	<ul style="list-style-type: none"> -Annual Research Symposium / live broadcast -e-newsletter -Annual Report -Web site -Use social media to reach a large category of audience (Facebook, You Tube) 	<ul style="list-style-type: none"> -rank of Web site on Google -number of hits on Web site and YouTube -number of Facebook followers -number of annual reports distributed

4. TEACHING/EDUCATION STRATEGIES

Strategic goal	Objectives	Actions	Performance measures
<p>ENHANCE AND EXPAND AGROFORESTRY TEACHING/ EDUCATIONAL PROGRAMS</p>	<p>Improve formal education in agroforestry</p>	<ul style="list-style-type: none"> -Develop an undergraduate emphasis area in agroforestry -Develop an undergraduate internship program in agroforestry -Develop online undergraduate/graduate certificate and MS degree -Increase graduate enrollment in agroforestry -Explore opportunities to bring in Peace Corps Masters International to campus -Develop an agroforestry component to multiple study abroad programs in CAFNR 	<p>Performance measures</p> <ul style="list-style-type: none"> -Number of students involved in various programs No. of undergraduate No. of interns No. of masters students trained No. of masters degree awarded No. of certifications awarded No. of out-of-state students No. of international students

Report on Center’s Outcomes; Results of the UMCA Strategic Road map—2010-2015


EXPECTED OUTCOMES	Performance measure	Five-year results						
		Base line	2010	2011	2012	2013	2014	2015
Increase external funding	-total award dollars/FTE -external dollars/FTE -% of salary provided by ext. funding							
Increase research quality	-refereed publications/FTE -number of researchers in scientific panels							
Increase research productivity	-number of students: undergraduate, graduate, post-docs -total publications/FTE -number of presentations (posters/abstracts)							
Improve agroforestry knowledge and technology transfer to all stakeholder categories	-number of events organized/sponsored by UMCA -number of UMCA-sponsored event participants -number of people reached -number of UMCA publications -number of UMCA publications distributed -number of media events							
Increase outreach	-rank of website on Google -number of hits on website and YouTube -number of Facebook followers -number of annual reports distributed							
Improve formal education in agroforestry	-number of students involved in various programs: undergraduate students, interns, masters -number of masters degree awarded -number of certifications awarded -number of out-of-state students -number of out-of-country students							

UMCA

203 ABNR Building
Columbia, MO 65211
USA

Phone: 573-884-2874
Fax: 573-882-1977

Website: centerforagroforestry.org

 The Center for Agroforestry
University of Missouri

A Global Center for Agroforestry, Entrepreneurship and the Environment
