

Proceedings of the 13th North American Agroforestry Conference  
June 19-21, 2013  
Charlottetown, Prince Edward Island, Canada

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# **CREATING THE KNOWLEDGE INFRASTRUCTURE TO ENHANCE LANDOWNER ADOPTION OF AGROFORESTRY THROUGH AN AGROFORESTRY ACADEMY**

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## **ABSTRACT**

Agroforestry offers a novel approach to land management that provides opportunities to combine productivity and profitability with environmental stewardship, resulting in healthy and sustainable agricultural systems that can be passed on to future generations. In spite of significant advances in both the science and practice of US agroforestry over the past 20 years, adoption has been limited. In the US, natural resource professionals and other educators are currently not equipped to help landowners adopt agroforestry. To advance adoption of agroforestry as a cornerstone of productive land use, a week-long agroforestry academy is being developed by a regional consortium of experts from Missouri, Iowa, Nebraska, Minnesota and Wisconsin. The academy is designed to train natural resource professionals, extension agents, and other agricultural educators who work with landowners. Advanced training will be provided on the five recognized temperate zone agroforestry practices integrated with options for bioenergy, marketing, economic, social dimensions, and environmental services. The cornerstone of the academy will be an applied planning and design exercise. Academy trainees will work in small groups to gain hands on practice in agroforestry design based on the needs of a working farm. Academy trainers and graduates will form the core of the knowledge infrastructure needed to enhance landowner adoption of agroforestry, resulting in increased sustainability of rural communities and the food and agricultural system.

Keywords: train-the-trainers, learning communities, agroforestry education

## **INTRODUCTION**

US agricultural and rural communities face ongoing challenges including profitability and environmental stresses (e.g., floods and drought), that threaten the livelihoods and well-being of many who work the land and/or live in rural areas. Agroforestry offers opportunities to help address many of these challenges and introduce environmentally, economically and socially sustainable agricultural systems that create new opportunities for farmers, ranchers, forest landowners, and families in rural communities (Jose et al., 2012).

Agroforestry is the intentional mixing of trees and shrubs with crop and/or animal production systems to create economic, environmental, and social benefits. Agroforestry land use practices are intentional, intensive, integrated, and interactive. There are five widely recognized agroforestry US practices: 1) windbreaks -living fences that protect field, farmstead, and livestock; 2) riparian and upland buffers that act as sponges and filters to protect water quality; 3) silvopastoral systems with trees, livestock, and forages growing together; 4) alley cropping which integrates annual or perennial crops with high-value trees and shrubs; and 5) forest

farming where food, herbal (botanicals), and decorative products are grown under the protection of a managed forest canopy.

The benefits of agroforestry include opportunities to enhance our local-regional-national food, income, environment and energy security. When properly designed and integrated, agroforestry protects crops, improves crop yields, creates resilient production systems that adapt to climatic extremes (e.g., droughts and floods), shelters livestock, reduces animal stress while improving weight gain; improves water and air quality; and enhances biodiversity and landscape diversity. On smaller farms (e.g., as small as 10 acres) unable to compete in large commodity markets, agroforestry provides opportunities to produce specialty crops and integrated intensively managed tree/livestock systems that help make these operations profitable while providing jobs and increasing wealth in rural communities (Gold et al., 2009).

The public is demanding more food from local and regional systems, as evidenced by the rapid increase in farmers markets, i.e., from 2,863 in 2000 to 7,864 in 2012 (Agriculture Marketing Service, 2012). Agroforestry is part of the solution for our rural lands to sustainably produce the food, fuel (e.g., biomass/biofuels) and other products in demand in local, regional, national and international markets. Enhancing and diversifying the production capabilities of rural lands, agroforestry practices will help revitalize rural communities by providing opportunities for small farms to be profitable and enable all categories of aspiring young farmers to view agriculture as a viable career.

## EXISTING AGROFORESTRY INFRASTRUCTURE

Significant advances have been made in the science and practice of agroforestry over the past 20 years, yet on-the-ground application of agroforestry practices has lagged with the exception of government subsidized windbreaks and riparian buffers. Creating greater awareness of agroforestry's benefits will lead to increased acceptance and adoption of agroforestry, resulting in increased financial security and environmental protection for all classes of farmers, ranchers, forest owners, and communities. Over the past decade, numerous actions have been taken at the local, regional and national level to advance agroforestry research and increase agroforestry adoption.

Locally, in Missouri, the MU Center for Agroforestry (UMCA) supports the largest US university agroforestry program and maintains a comprehensive set of agroforestry research, education (Gold and Jose, 2012) and outreach programs. UMCA and numerous collaborators actively conduct research to discover, integrate and apply new knowledge and technologies to promote economic, environmental, and social vitality while also educating and training students, professionals, scientists, leaders, and the general public who are empowered to make a difference locally, regionally, and globally.

The Mid-American Agroforestry Working Group (MAAWG) was established in 2009 to advance the science, practice and adoption of agroforestry by landowners and natural resource managers in the US Midwest (MO, IA, NE, MN, WI). MAAWG's goals include the identification of the core issues (gaps, barriers, conflicts, opportunities) needed to advance adoption of agroforestry as a cornerstone of productive land use in the Midwest; and to initiate

actions to address and resolve these core issues (MAAWG, 2013). UMCA is an active member of MAAWG.

Working at the national level, the USDA National Agroforestry Center (NAC) accelerates agroforestry application through a national network of partners who conduct research, develop technologies and tools, coordinate demonstrations and trainings, and provide useful information to natural resource professionals (NAC, 2013). In June, 2011, with prior input from a diverse group of 90 stakeholders, the USDA released an Agroforestry Strategic Framework, a roadmap for advancing the science, practice, and application of agroforestry as a means of enhancing America's agricultural landscapes, watersheds, and rural communities (USDA, 2011). The Framework's first goal is to increase agroforestry adoption by landowners and communities by expanding learning partnerships with stakeholders and educating professionals. A major concern is the fact that professionals, including USDA NRCS and state agency conservation staff, are currently not sufficiently equipped to provide technical, financial, and marketing assistance needed to plan and apply agroforestry systems.

## THE APPROACH

To achieve on-the-ground adoption of agroforestry, it is essential to train a core group of individuals within State and Federal Government Agencies, University Extension, Non-Profit, and Professional Organizations who deal with land management issues and/or interact with farmers and landowners. It is also of utmost importance to facilitate collaboration among researchers, extension personnel, and practitioners, diverse disciplines, departments and colleges, and different agencies and organizations.

To help create the knowledge infrastructure leading to enhanced landowner adoption of agroforestry as a cornerstone of productive land use, a week-long agroforestry academy is being developed by a regional consortium of experts from Missouri, Iowa, Nebraska, Minnesota and Wisconsin. The agroforestry academy will provide "train-the-trainer" professional development to agriculture and natural resource professionals and extension personnel agriculture as recommended by both MAAWG and USDA Strategic Framework goals. Increasing the knowledge of professionals in agroforestry will allow them to transfer these strategies and principles to an even broader audience that reaches into rural communities across five Midwestern states. Importantly, the agroforestry academy will help to create a learning community of researchers, professionals and practitioners with a range of expertise in agroforestry that will facilitate education, idea exchange, and adoption.

## THE AGROFORESTRY ACADEMY

**Planning for the Academy:** A number of actions and activities need to take place prior to the offering of the agroforestry academy.

First: Agroforestry academy partners will meet monthly prior to the launch of the first academy to review and finalize logistics, topics, schedule, content, etc.

Second: The agroforestry academy training manual to be used in 2013 will be updated from the 2006 UMCA agroforestry training manual (UMCA, 2006) containing the latest scientific knowledge and outreach materials developed since 2006. For academy participants, the manual will be provided in hard copy and as an online resource which will include videos, all live-

streamed agroforestry academy presentations and hotlinks to additional resources). The online manual will be cross-linked to all partners in the five-state area. The manual will incorporate and benefit from input and active collaboration with MAAWG, and NAC.

Third: An online agroforestry academy portal will be created. A key element of the academy design is creation of both an online forum for academy participants and graduates, and a web home for an online learning community. The learning community site will house both the forum and agroforestry resources such as the recorded academy workshops, and the 2013 training manual. It will provide a means to link researchers, professionals and practitioners and facilitate education and idea exchange. The learning community will be hosted on UMCA website, and cross-linked with partner organizations across all the states.

**Target audience:** The target audience includes Agriculture and Natural Resource professionals; Univ. Extension personnel; Certified Crop Advisors; USDA NRCS, and FSA field staff; Soil and Water Conservation District personnel; Farm Bureau, Farmers Union, conservation groups (especially those with tree and forest missions such as Trees For Ever and American Forest Foundation) and similar organizations. At least two individuals from each agency within each state will be recruited as trainees so that they will be able to network together post academy (along with all of their new agroforestry learning community members) to affect change in the state. By enrolling in the academy, participants will, with technical assistance from academy organizers, commit to organizing spin-off trainings within one year of completion and to report results. They will also participate in the online learning community forum.

**Academy design:** With an initial two-year funding commitment from the USDA NCR-SARE PDP competitive grant program, the academy will consist of a week-long “train-the-trainer” program containing classroom presentations and visits to practitioners’ farms culminating with a “hands-on case study” exercise in agroforestry design. The first two days of the academy will include workshops (comprehensive classroom presentations) on the latest science and practice in support of agroforestry practices plus information intended to assist landowners develop financial budgets for agroforestry practices and market the products they grow. Days three and four will consist of visits to practitioners’ farms with established agroforestry sites along with a “hands-on case study” farm that does not yet contain agroforestry. The academy will conclude with an agroforestry design exercise which will sum up all the knowledge and experience received during the week and apply it to the “hands-on case study” farm. The case study design exercise (with small group presentations and follow-up discussions) will facilitate experience in the implementation of agroforestry design and will encourage collaborative learning community efforts. The planning process will help participants envision how agroforestry practices can be successfully integrated on a farm. Lunch and dinner will also include presentations from a number of agroforestry practitioners, partner agencies and group discussions. Workshops will be recorded and made available for later use. The curriculum will be targeted to specific audiences of natural resource and agricultural professionals with national application. The one-week academy will be repeated the second year in a new location.

## CREATING THE KNOWLEDGE INFRASTRUCTURE

The agroforestry academy and associated activities are designed to help create the knowledge infrastructure to enhance landowner adoption of agroforestry. As a result of the academy, it is expected that knowledge about agroforestry and communication within and between core agencies and organizations will be strengthened. The number of key individuals with a working knowledge of agroforestry practices will be increased. As participants of the academy, attendees will realize new opportunities to interact across agency and organizational boundaries, and to creating or enhancing knowledge networks. There will be an increased incidence of extension and natural resource professionals recommending agroforestry to landowners. Academy graduates offering spin-off trainings to farmers and landowners will result in increased adoption of agroforestry.

Based on their new knowledge and relationships, academy graduates will help to identify necessary and innovative policy changes that facilitate agency support for agroforestry. Any subsequent policy changes within agencies and organizations will reflect knowledge gained and an appreciation for the benefits of agroforestry practices applied to the farm. Such changes, if implemented, will result in greater cooperation and collaboration between agencies, organizations, and natural resource professionals when recommending agroforestry and other sustainable forest and farm management practices.

The long-term goal of the agroforestry academy is to increase landowner adoption of agroforestry practices resulting in a greater diversification on farm landscapes, enhanced farm sustainability through product diversification and enhanced stewardship of farm resources.

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