

INTENSIVE SILVICULTURE FOR LAKE STATES POPLAR

A McIntire-Stennis supported project



Michigan Tech
School of Forest Resources
and Environmental Science

Tree plantations established on retired agriculture land provide the clearest and strongest example of a feedstock for producing biomass and bioenergy with a net negative carbon emission to the atmosphere. Biomaterials obtained this way can aid in achieving domestic energy security and reducing fossil carbon emissions to the atmosphere, which is a leading cause of global climate change. Plantations require management, however, and models of productivity and carbon sequestration are essential to determining their sustainability and economic feasibility.

Beginning in 2008, a network of small experimental to field-scale poplar plantations was established across northern Michigan with the intent of continuing data collection across the 11 sites to measure individual trees, collect soil and litter samples to estimate carbon and nitrogen, and to compile, verify and integrate the collected data into an established database.

The overall goal of this research project is to assess the effects of intensive silvicultural practices on growth-and-yield and carbon sequestration in hybrid poplar plantations in Michigan. We want to understand how fast trees grow, how fast biomass is produced, and whether production, itself, changes the leftover carbon that is stored at the plantation site. The cumulative database on individual and plantation growth and yield, forest productivity, and carbon sequestration provide a long-term foundation for studies of the sustainable production of biomass for renewable energy and biomaterial applications.

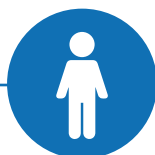


About McIntire-Stennis

The McIntire-Stennis program, a unique federal-state partnership, cultivates and delivers forestry and natural resource innovations for a better future. By advancing research and education that increases the understanding of emerging challenges and fosters the development of relevant solutions, the McIntire-Stennis program has ensured healthy resilient forests and communities and an exceptional natural resources workforce since 1962.



COLLABORATION



11

Plantations were established on former agricultural land across the State of Michigan

The tree plantations were initially established through grants from Wolverine Power Cooperative, the U.S. Department of Energy, and Michigan Technological University

IMPACT



14,700

survival, height and diameter measurements were collected

The data collected provide an objective and verifiable basis for understanding production of biomass and other ecosystem services. These are essential for landowners to make good decisions, and for policymakers to make reliable assessments of social, economic, and environmental impact



2

students- one Ph.D and one MS used these data as foundations for their research



58,000

measurements of one or more attributes from planted trees were compiled in the database