



State University of New York
College of Environmental Science and Forestry

Department of Forest and Natural Resources Management

Dear AASHE STARS Program Staff,

This letter is being submitted in affirmation of SUNY-ESF's Woody Biomass Program as an Innovation credit in STARS. In 1986, ESF initiated willow biomass research. For over two decades, SUNY-ESF has teamed up with over 20 organizations to facilitate the commercialization of willow crops and other woody biomass for bioenergy and bioproducts in the Northeast and Midwest United States. Driven by concerns about global warming, air pollution, rural development and national security, the woody biomass research conducted by SUNY-ESF has reconnected the historic willow cultivation industry to central New York.

The willow biomass cropping system is being developed as a sustainable system to supply woody biomass from marginal agricultural land for the production of heat, electricity, biofuels and bioproducts. Shrub willow was chosen for its high biomass production potential on marginal agricultural land. Not only does the plant re-sprout vigorously after each harvest, it also has a wide range of genetic variability, and limited insect and pest problems. The willow crop can be harvested every three years, and is seen as both an alternative and a supplement to fuel that is gathered from forests and woody residue from wood processing industries. Over 40,000 commercial acres of willow have been planted in Europe, and only 1,000 acres have been planted in the U.S. Currently, the only commercial willow planters in the U.S. are in New York State and were initiated as a collaborative effort with SUNY ESF.

The perennial nature of this system provides a wide array of other environmental and rural development benefits. Life cycle analysis of willow biomass crops has shown that they are low carbon fuels because the amount of CO₂ taken up and fixed by the crop during photosynthesis is almost equal to the amount of CO₂ that is released during the production, harvest, transportation and conversion of the biomass crop to renewable energy. In addition this analysis has shown that willow biomass crops have a net energy ratio of 1:55. This means that for every unit of nonrenewable fossil fuel energy used to grow and harvest willow, 55 units of energy are stored in the biomass itself. Transporting the woody biomass 25 miles from the edge of the field and using it to generate electricity results in a net energy ratio of 1:11 to 1:15 depending on the conversion system. The perennial nature of the crop means that soil quality is improved over time and these fields provide habitat for a wide range of birds and other wildlife. By making use of marginal land, willow biomass crops will create new job opportunities in rural communities.

SUNY ESF initiated this research over two decades ago and remains a leader in the development of this system in North America. Over the past few years SUNY ESF has teamed up with collaborators to establish trials in six states and three provinces in Canada. In addition we have collaborated with commercial partners to transfer the knowledge that has been gained to facilitate the expansion of the crop. We supplied improved plant material and knowledge with a commercial nursery that now has over 100 acres of willow

nursery beds that are managed for commercial production of planting stock. In addition we have facilitated the connection between a European manufacturer of the specialized willow planting equipment and a small U.S. based company. This U.S. company now has the rights to produce this planter for the North American market. In the past few years SUNY ESF and Case New Holland has built a collaborative partnership to develop a harvesting system for willow biomass crop based on a New Holland forage harvester. We have also been working to incorporate this material into teaching and outreach missions. Last year we established two demonstration plots on campus that will be used for teaching and education of students, visitors and the general public.

Converting willow biomass to renewable energy has the potential to provide economic, energy, and rural development benefits to Upstate New York, and ESF is driving this prospect. As such, I believe that this program qualifies as an Innovation Credit in ESF's STARS assessment.

Sincerely,

A handwritten signature in black ink that reads "Timothy A. Volk". The signature is written in a cursive style with a large, sweeping initial 'T'.

Timothy A. Volk, PhD

Co-Director
SUNY Center for Sustainable and Renewable Energy
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