

**Biomass production in the Chariton Valley area of south central Iowa:
Farmers' motivations for adoption of switchgrass**

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Switchgrass (*Panicum virgatum*) is a perennial warm-season grass native to Iowa, grown for decades on marginal lands not well suited for conventional row crops. It is now being recognized as a potential energy source and alternative cash crop for Iowans. The Chariton Valley Biomass Project is Iowa's first major switchgrass demonstration project, promoting switchgrass' potential for large-scale production. Iowa imports 98 percent of the fuels needed to generate energy in the state. Future success of a domestic energy industry in Iowa is dependent on the development of alternative energy sources, including biomass. The support and participation of biomass producers will be critical to this future. Currently, more than 80 farmers in southern Iowa dedicate close to 7,000 acres of land planted in switchgrass for the Chariton Valley Biomass Project. The majority of these producers have invested significant time and financial resources during the past three years to assist with biomass project planning despite the fact that no market currently exists for switchgrass as an energy crop.

The Biomass Project goal is to demonstrate switchgrass as an energy source by co-firing it with coal at Alliant Energy's Ottumwa Generating Station in Chillicothe, Iowa. Project organizers estimate that 50,000 acres or 200,000 tons of switchgrass will be required to produce 35MW of electrical power at a 5% co-fire rate. Accomplishment of the long-term project goal of producing and using 200,000 tons of biomass annually to generate electricity will likely require the participation of as many as 500 agricultural producers. If co-firing proves successful, the Chariton Valley Biomass Project will be challenged to recruit sufficient numbers of switchgrass producers to meet demands. To develop recruitment guidelines and strategies that will foster future switchgrass adoption and long-term commitment to energy crop production, better understanding of the factors southern Iowa farmers consider when evaluating alternative land uses, economic activities on the farm, and resource allocation is needed.

To complement the extensive agronomic and economic research underway on the viability of switchgrass production for biomass [1], we designed an ethnographic research project. Through comprehensive on-farm interviews we were able to ascertain the motivations behind adoption of energy crops, especially switchgrass, in southern Iowa. In addition we discovered obstacles to, and consequences of adoption. We interviewed fifty-two members of the agricultural community in six southern Iowa counties between March and August of 2000. In addition, we reviewed archival documents, took facility and farm tours, had casual conversations with rural community members, and spent time in many fields, pastures, barns, and farm homes to better understand the context in which southern Iowa farmers make decisions.

The paper and presentation we propose for the Fifth International Biomass Conference of the Americas will discuss the results of this research. Specifically, we will discuss:

- ✍ What motivates or discourages adoption of switchgrass and other energy crops, alternative agricultural practices, and varied land uses?

- ✍ What are the incentives and disincentives to adoption of switchgrass as an energy crop, including profit, risk, uncertainty, reputation, inputs and equipment availability, financial status, financial guarantees, program subsidies, support networks, learning curves, community attitudes, and family attitudes?

✍️ What crop and product attributes, infrastructure and markets, and financial and community support programs facilitate or impede adoption?

Profitability was usually the first identified motivation for adoption of any crop. However, it was apparent that intangibles not easily quantified or explained by economic theory were important determinants of adoption attitudes and behaviors. Participants in this study provided many insights to their motivations for adopting switchgrass and/or other alternative farming activities or practices. Rarely were they motivated by just one thing, but rather a combination. Most participants had difficulty identifying which motivations were primary, secondary, tertiary, and so forth. Instead they said a variety of considerations came into play at different times, and usually they weighed the relative advantages and disadvantages. Among these were: profitability, return on investment, and economic sustainability; fit with current farming operations, compatibility with other farming demands, compatibility with land tenure and acreage control, and compatibility with off-farm employment; capital outlay requirements, the degree of complexity added, and commensurate rewards; compatibility with personal and family values and beliefs, health and safety issues, environmental concerns, aesthetic considerations, and other quality of life measures.

Research participants identified other factors favorable to the adoption of alternative commodities such as switchgrass and other energy crops. Few of these factors in and of themselves served to make or break an adoption decision. Nonetheless they were important considerations for farmers. Favorable factors included: tax incentives for value-added products or renewable fuels; expanded use of CRP lands to support production (with or without payment deductions); ease of application—for programs or practices; reduced expenditures—cost savings can be as important as increased revenues; cash receipts—promised future income is sometimes less important than cash-in-hand today; price premiums—commensurate with the extra efforts required; secure incentives with no evaporation in subsequent years; high local demand; and markets for transitional crops.

While contentment or inertia might both explain why farmers in southern Iowa would not readily adopt farming activities and practices better suited to area soil conditions and resources, many things discourage them or thwart their attempts. Southern Iowa farmers indicated a number of factors that discourage adoption of switchgrass, including: a general and pervasive skepticism and/or distrust of government programs, policies, rules, and regulations; CRP restrictions against land management, grazing, or harvesting; financial penalties (withheld payments or repayment requirements) for breach of CRP rules; requirements to mix expensive (indeed, cost prohibitive) forbs and legumes with switchgrass; fiscal double-standards and inadequate subsidies; lack of acreage control and the protracted time required for establishment of a crop; and the inability to obtain crop insurance or receive LDP on alternative crops, especially by risk-averse farmers, many of whom are younger or newer to farming.

Many potential adopters of switchgrass expressed a desire to “test the water” first. They are cautious of a long-term commitment without knowing the outcome. As with any new crop, switchgrass production presents a “chicken and egg” dilemma: to get the power plants to use switchgrass there has to be a guaranteed supply, but to get the farmers to grow the switchgrass they have to be assured demand at a favorable price. Understanding motivations is crucial as we try to address such problems.

References

[1] Brummer, E. Charles, C. Lee Burras, Michael D. Duffy, Kenneth J. Moore, Rocky Lemus, Neil Molstad, Virginie Nanhou, and William Weaver. *Switchgrass Production in Iowa: Economic Analysis, Soil Suitability, and Varietal Performance, 1998 Annual Report*. Iowa State University.