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Competitive Bidding as a Means of Extracting and Demonstrating Farmer Willingness-to-Grow an Alternative Crop

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Competitive Bidding as a Means of Extracting and Demonstrating Farmer Willingness-to-Grow an Alternative Crop

Abstract

Switchgrass has been identified as a model renewable energy feedstock. This article describes a project to evaluate the feasibility of producing a switchgrass crop in Tennessee dedicated to energy production. An unusual feature of this research/demonstration project is its use of a competitive bidding process to elicit estimates of the willingness of Tennessee producers to displace traditional crops with switchgrass. One goal of this process was to supplement survey data with "real world" information that would increase the credibility of the project's results among potential market participants. This approach may prove interesting to readers faced with dwindling experiment station resources.

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Introduction

Value-added enterprises are increasingly seen as a way for agricultural producers to reverse shrinking net returns. While traditional research and Extension activities are able to identify and evaluate these enterprises, subsequent development is often stymied by a sequencing or "chicken-or-egg" question, where potential suppliers and purchasers are reluctant to invest resources in a commodity absent a functioning market for that commodity. The following describes a project designed to address this challenge through both research and demonstration activities.

The Project

The University of Tennessee Institute of Agriculture, through the Tennessee Switchgrass Project, is currently evaluating the potential for large-scale production of switchgrass in Tennessee.

Switchgrass is a warm season, perennial grass that can be used to produce energy in a variety of ways (Burden, 2003; McLaughlin et al., 1999; USDOE, 1998). Switchgrass has been designated a "model energy feedstock" because it is:

- Well-adapted to grow in much of the country with low fertilizer applications and high resistance to naturally occurring pests and diseases;
- Widely used in soil conservation efforts because of its extensive root system and ability to tolerate poor soils, flooding and drought; and

- An exceptional forage and habitat for native wildlife (McLaughlin et al., 1999).

Thus, growing switchgrass for energy production could increase returns to agricultural producers while providing a variety of environmental benefits (de La Torre Ugarte, Walsh, Shapouri, & Slinsky, 2003).

An important objective of the project is to both evaluate and demonstrate the ability and willingness of Tennessee producers to grow switchgrass. This objective is being pursued through two traditional activities, field tests at an experiment station and a mail survey of a random sample of Tennessee producers, and one not-so-traditional activity, competitive bids by individual growers to produce switchgrass.

Rationales

Actual switchgrass production was included in the project in order to:

- Provide a feedstock for conversion testing,
- Estimate potential yields and production costs, and
- Develop management guidelines specific to Tennessee.

While these objectives could be accomplished through field tests at an experiment station, "on-farm" production was included to:

- Incorporate a wider range of soil types and other physical conditions,
- Analyze interactions between switchgrass and other production activities,
- Compare performance under various levels of managerial ability and under experimental and realistic farm conditions (Lockeretz, 1987), and
- Demonstrate to potential market participants the willingness and ability of Tennessee producers to grow switchgrass under a four-year contract.

Along these lines, on-farm production is expected to provide more specific information on:

- Equipment modification,
- Conflicts between switchgrass harvesting and other activities,
- Temporary storage, loading and transportation of harvested switchgrass, and
- A variety of issues related to contractual relationships between switchgrass growers and energy producers.

On-farm production was also designed to provide information on the willingness of Tennessee farmers to substitute switchgrass production for traditional cropping activities by allocating participation among producers through a competitive bidding process. This process was chosen to satisfy practical concerns over the selection of producers and to provide "revealed preference" data on producer willingness-to-grow to supplement the "hypothetical" data generated by the mail survey. While certain constraints of the bidding process (such as acreage restrictions) and the relatively small number of bidders limits statistical analysis, the presence of real economic incentives infuses the bids with a degree of credibility that a survey cannot match.

The Process

Bidding was conducted under university guidelines that allow bid evaluation to include factors other than cost. These guidelines required that bids be divided into a cost and a non-cost bid, and bidders were made aware that while low-cost bids would be favored, cost alone would not be determinative. The non-cost bid was designed to gauge the bidder's suitability for the project, including among other factors the range of acreage the bidder was willing to devote to switchgrass production. A copy of the non-cost bid form is available at http://beag.ag.utk.edu/docs/RFP_switchgrass.pdf.

The cost bid had two components--a base payment stated in dollars per acre, plus an incentive payment stated in dollars per ton of switchgrass produced. Bidders were informed that cost bids would be evaluated on the basis of a single per acre bid, calculated by adding the base payment to the product of the incentive payment and an estimated average annual yield of 5.5 tons/acre. Thus, the cost bid resembled a first-price sealed bid auction.

Contracts

While the 4-year commitment needed from growers made written contracts a necessity, a conscious effort was made to avoid an overly burdensome or "legalistic" contract. Thus, all bidders

executed a three-page written contract consisting of the university's standard form plus one page of additional terms. A copy of the contract, the first page of which doubled as the cost bid, is available at http://beag.ag.utk.edu/docs/switchgrass_grower_k.pdf.

Bid Solicitation

Solicitation of bids began with an informational meeting held at an experiment station. The meeting included presentations on switchgrass production, the project, and the contract and bidding process. Bidding forms were distributed at the meeting, and county Extension agents took copies for distribution in their counties. After the meeting, participants were invited to view switchgrass field tests being conducted at the experiment station. Bids were due approximately 4 weeks after the meeting.

Bids

A total of 11 bids were received, five of which were accepted (Table 1). There was little difference in responses to the non-cost questions, other than the range of acreage bid into the program. Bidders submitted a minimum and maximum acreage, with the university reserving the right to choose any acreage within that range. Bidders were informed that the ideal result was to have 10 producers growing approximately 10 acres each.

While most of the bids were for more acreage, few were for substantially more. However, one bidder (Bidder 1) was excluded on this basis, and the low acreage allotments likely dissuaded some producers from bidding. In general, the bids reflected an understanding of both the bidding process and payment structure.

Table 1.

Bidder	Minimum Acres	Maximum Acres	Base Bid (per acre)	Incentive Bid (per ton)	Total per Acre Bid (at 5.5 tons per acre)	Acres Awarded
1	70	100	\$200.00	\$7.50	\$241.25	0
2	10	20	\$250.00	\$0.00	\$250.00	15
3	8	15	\$225.00	\$20.00	\$335.00	15
4	10	50	\$200.00	\$30.00	\$365.00	30
5	12	30	\$250.00	\$25.00	\$387.50	12
6	20	100	\$255.05	\$25.00	\$392.55	20
7	10	50	\$250.00	\$30.00	\$415.00	0
8	10	20	\$255.34	\$30.00	\$420.34	0
9	16	16	\$200.00	\$50.00	\$475.00	0
10	10	15	\$62.00	\$110.00	\$667.00	0
11	10	20	\$900.00	\$30.00	\$1,065.00	0

Bid Selection

Contracts for a total of 92 acres were awarded to Bidders 2 through 6, as shown in Table 1. Contract awards were based both on cost and on securing as much diversity as possible among the winning bidders to maximize the research and demonstration effects of the on-farm production component of the project.

Conclusion

The project described here used on-farm production and a competitive bidding process to extract information on switchgrass production and the values needed to prompt Tennessee producers to replace traditional cropping practices with switchgrass production. These values will supplement data obtained from a mail survey of Tennessee farmers. Due to the small number of bids and the acreage constraints placed on bidders, these values are likely to add little to the statistical analysis of the survey results. However, they do possess a certain "real world" credibility that the survey results may lack.

This credibility should help to ameliorate some of the sequencing problems associated with developing a new value-added enterprise. These relationships should also serve to demonstrate potential solutions to a variety of issues associated with the contract production of switchgrass to both potential producers and purchasers of switchgrass.

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