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Essential Elements for Producer Participation in Biomass Markets

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Essential Elements for Producer Participation in Biomass Markets

Abstract

Opportunities for agricultural producers to provide lignocellulosic feedstocks to manufacturers of biobased products such as ethanol, butanol, and fine chemicals are emerging. When evaluating such biomass market opportunities, several factors must be considered (e.g., sustainability, possible harvest delays, labor availability, initial investment, risk). The primary objective of this study was to develop rigorous constructs defining the essential elements for producer participation in biomass markets. In this paper, we report the results and analysis of a mail survey of 2,250 Iowa producers farming 50 acres or more. The survey instrument was developed using relevant items to assess essential elements for producer participation in biomass markets. Semantic Differential Scales (rating from one to seven with polar opposites as scale anchors) were used and the Dillman Protocol was followed. Producers returned 885 surveys, 645 of which were complete, for a response rate of 28.7%. Exploratory factor analysis was used to analyze the survey data and group survey items into multi-item constructs.

Keywords

Biomass supply chain, Iowa, producer survey, producer attitudes, biomass market, lignocellulose, feedstock, cellulose

Disciplines

Agribusiness | Agriculture | Bioresource and Agricultural Engineering

Comments

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Essential Elements for Producer Participation in Biomass Markets

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2012 ASABE Annual International Meeting
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using relevant items to assess essential elements for producer participation in biomass markets. Semantic Differential Scales (rating from one to seven with polar opposites as scale anchors) were used and the Dillman Protocol was followed. Producers returned 885 surveys, 645 of which were complete, for a response rate of 28.7%. Exploratory factor analysis was used to analyze the survey data and group survey items into multi-item constructs.

Keywords. Biomass supply chain, Iowa, producer survey, producer attitudes, biomass market, lignocellulose, feedstock, cellulose.

Introduction

Opportunities for agricultural producers to provide lignocellulosic feedstocks to manufacturers of biobased products such as ethanol, butanol, and fine chemicals are emerging. In 2013, DuPont Cellulosic Ethanol (Nevada, Iowa) and POET (Emmetsburg, Iowa) expect to start biofuel production facilities that will use lignocellulosic feedstocks. These anticipated ventures, and the ones to follow, offer producers exciting new opportunities to market biomass. The primary objective of this study was to develop rigorous constructs defining essential elements for producer participation in biomass markets.

Objectives

- Expand existing literature on procurement and producer participation in biomass markets.
- Capture survey data on producer perceptions of biomass procurement and sales.
- Offer information to producers and the biomass processing industry.

Materials and Methods

In February 2011, a 26-question mail survey was sent to 2,250 Iowa producers farming 50 acres or more. The survey used a scale that rated items from one to seven with polar opposites as scale anchors. Demographic data were also collected. The Dillman protocol was followed for survey administration. Producers returned 885 surveys of which 645 were complete for a 28.7% response rate.

Results and Discussion

Nearly all producers were male (96%) and were an average of 62 years old. Over 87% were at least the third generation in farming and nearly three-quarters (74%) had farmed at least 30 years. Many producers had completed postsecondary education (44%). Twenty-two percent indicated their highest level of education completed was a technical or two-year degree. An additional 22% had completed a 4-year or advanced college degree.

Over 99% of producers owned less than 2,500 acres of farmland and 96% farmed less than 2,500 acres. About half of the farms had less than 20% highly erodible land (HEL), over half of which had no HEL. Over a quarter (28%) of farms had more than 60% HEL. Many producers used a single tillage system, either no-till (12%), minimum till (28%), or conventional tillage (14%) with the remainder being mixed systems. Figure 1 shows the percentage of crops grown by producers as a percent of the farm. Beef and dairy cattle were raised on 39% and 5% of farms, respectively.

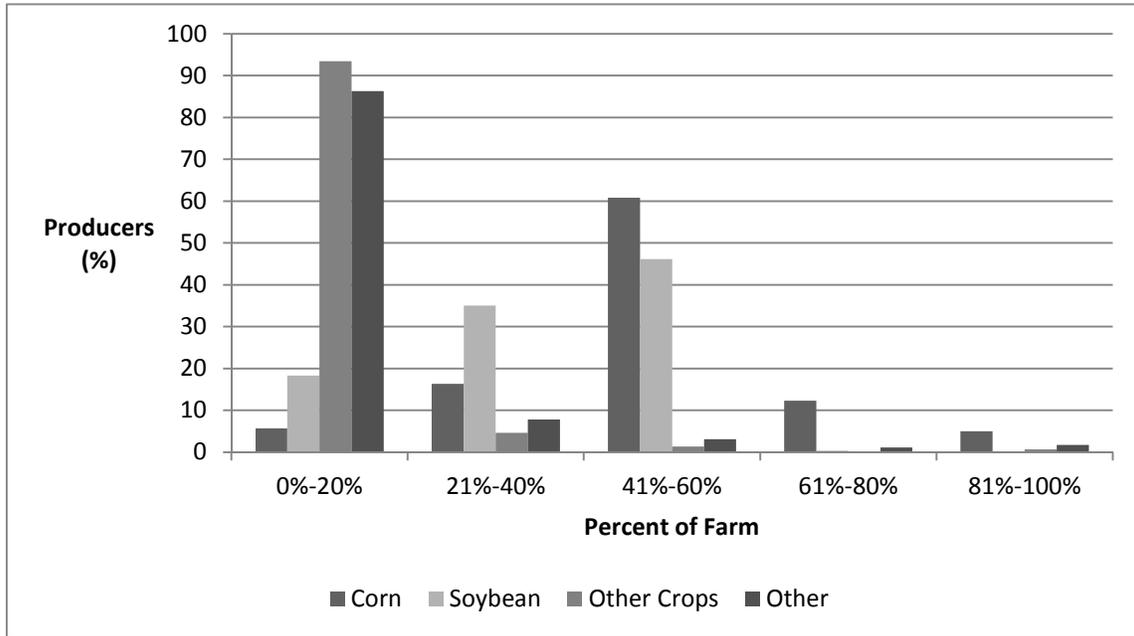


Figure 1. Crops grown by producers in percent of the farm.

About half (49%) of producers had sold corn to an ethanol plant and 16% had ownership in an ethanol or biofuel plant. Less than 1% had sold biomass to a cellulosic biofuel plant. Nearly two-thirds of producers (65.6%) lacked interest in supplying biomass for biofuels production, while the remainder showed moderate to strong interest (see figure 2). Producers were most interested in supplying corncobs and corn stover, and least interested in supplying trees.

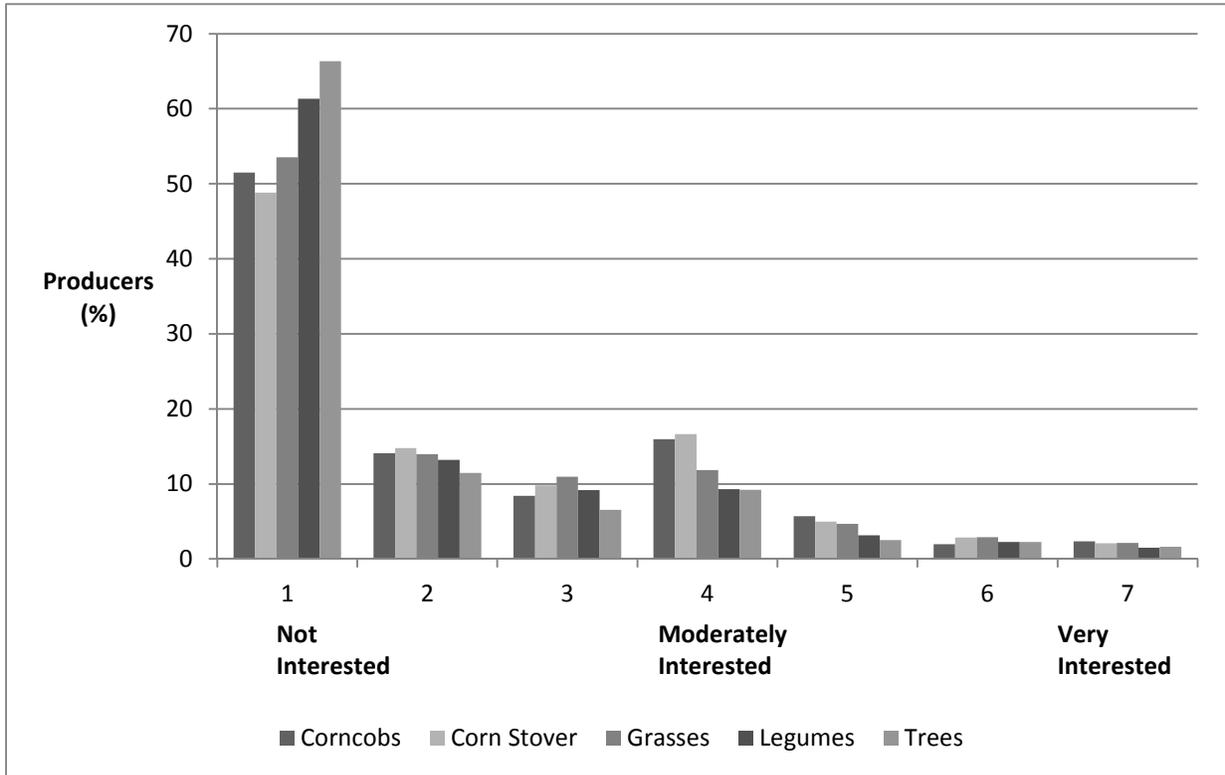


Figure 2. Producer interest in supplying biomass for biofuels production.

Producer knowledge about corn ethanol (mean = 4.5/7) was considerably greater than for lignocellulosic biofuels (mean = 3.1/7). Specific areas that producers had limited knowledge about were biomass pricing and removal cost, land sustainability, and harvest options. These data indicate there is an educational opportunity for the lignocellulosic biofuels industry, academic institutions, and other organizations. Table 1 shows producers consult a variety of information sources and no source was dominant.

Table 1. Producer information sources consulted about growing and marketing biomass (7-point scale).

Source	Mean	Source	Mean
Extension	3.8	Friends/Neighbors	3.5
Cooperatives	3.6	TV or Radio	3.3
Government	3.6	Crop Consultants	3.2
Print Media	3.6	Internet	3.2
Biomass Contractors	3.5	Legal Counsel	2.9

Producers were concerned about harvest, soil and residue management, and biomass marketing issues as shown in figures 3, 4, and 5.

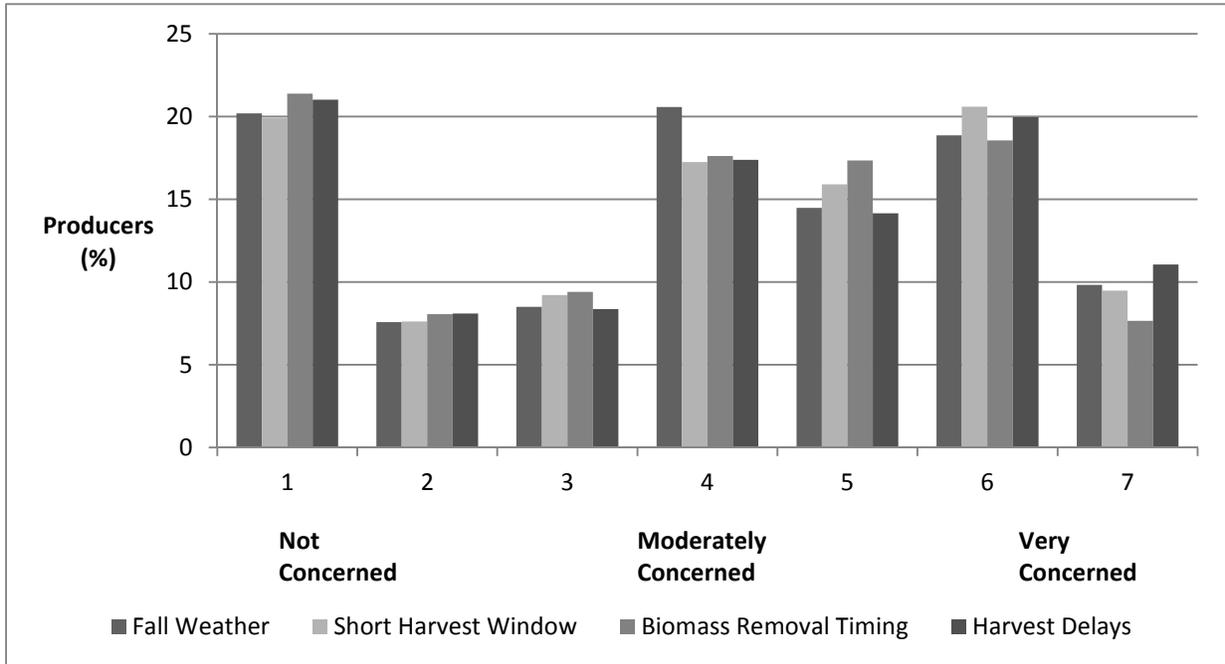


Figure 3. Producer concerns about harvest issues.

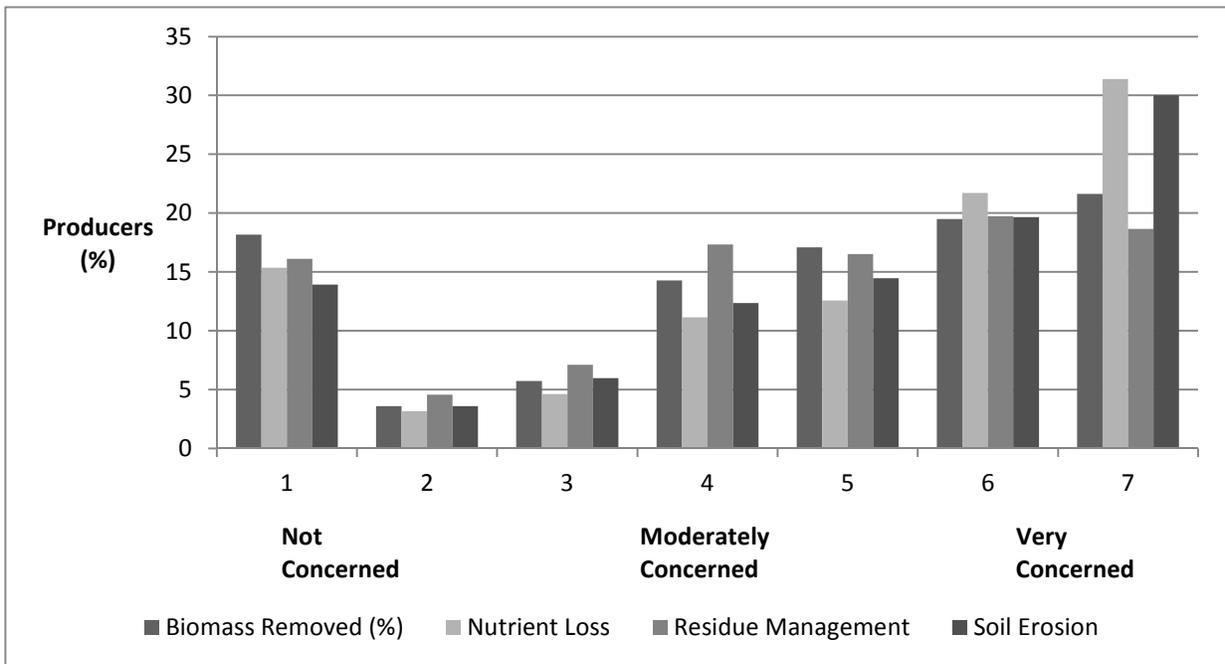


Figure 4. Producer concerns about soil and residue management issues.

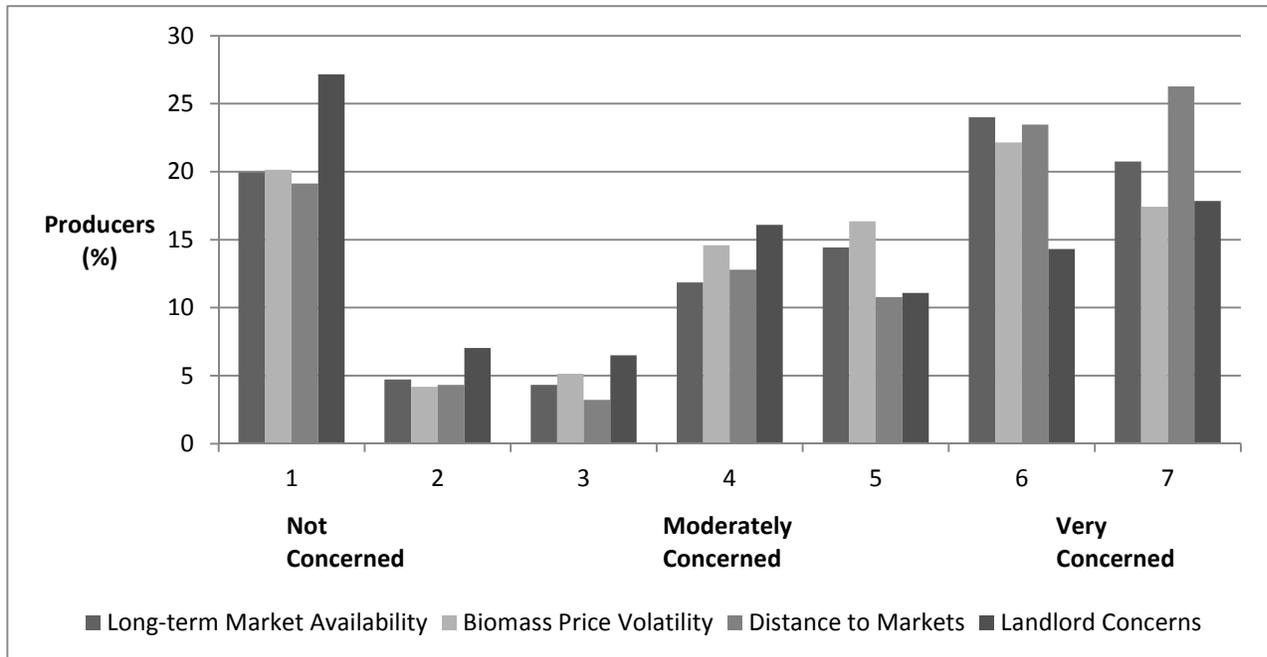


Figure 5. Producer concerns about biomass marketing issues.

To better understand producer concerns, Hoque et al. (2012) used multivariate probit estimation to identify the critical elements for producer participation in biomass markets that will be presented at the 2012 Agricultural and Applied Economics Association Annual Meeting.

Conclusion

About one-third of Iowa producers were moderately to very interested in supplying biomass for production of biofuels and biobased products. There is an educational opportunity for lignocellulosic biofuels industry, academic institutions, and other organizations. Producers were concerned about harvest, soil and residue management, and biomass marketing issues. There is an opportunity for research that identifies best practices for these areas of producer concern in biomass production.

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Poster Presentation

Hoque, M.M., G.M. Artz, B.J. Martens, and D.H. Jarboe. Antecedents to Biomass Procurement: The Essentials for Producer Participation. Agricultural and Applied Economics Association, August 12-14, 2012. (accepted)