

Dec 1st, 12:00 AM

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Hart, Chad, "Switching to switchgrass?" (2015). *Proceedings of the Integrated Crop Management Conference*. 11.
<https://lib.dr.iastate.edu/icm/2015/proceedings/11>

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Switching to switchgrass?

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Since the passage of the Renewable Fuels Standard, there has been a concerted effort to develop feedstocks for cellulosic biofuels. The CenUSA grant project, headed by Iowa State University, has been exploring the potential for perennial grasses over the past few years. “Liberty” switchgrass, developed by Rob Mitchell, a CenUSA researcher with USDA-ARS in Lincoln, Nebraska, has entered the market as a promising feedstock for cellulosic ethanol. In order to evaluate the potential for switchgrass on the Midwestern landscape, CenUSA researchers have created a decision tool to explore the costs and potential returns from switchgrass production and compare those returns to four alternatives: maintaining the acreage in the Conservation Reserve Program, utilizing the acreage for pasture, planting the acreage in the traditional corn/soybean rotation, or planting the acreage to continuous corn.

Decision tool set-up

The tool starts with a series of questions that depend on whether the area being considered for switchgrass is currently in the CRP, being utilized for pasture, in a corn/soybean rotation, or in continuous corn. The questions cover general production information for the field and switchgrass expectations. Based on the answers to the questions, production costs and revenues are computed for two scenarios: maintaining the field in its current use and converting the field to switchgrass.

The estimated cost of production for switchgrass is computed in four sections, reflecting particular production years in the life of this perennial crop. The first section presents production cost estimates for pre-establishment. Section 2 estimates costs of production in the establishment year. Utilizing an amortization factor, a pro-rated estimate is also provided illustrate the yearly cost of establishment spread across the life of the stand. Section 3 provides cost of production estimates for the second year of production. Since grass stands mature by year 3, the cost estimates are assumed to remain the same from year 3 and beyond. These estimates are shown in section 4. For the last 3 sections, the production costs are divided into (i) pre-harvest machinery costs, (ii) operation costs, and (iii) harvesting costs. For simplicity, we have not considered storage and transportation costs to the processing facility in the tool.

Information used in developing the crop budgets was obtained from existing agronomic research, expert opinions, and economic data such as the 2015 Iowa Farm Custom Rate Survey (Ag Decision Maker, File A3-10). Input prices, fertilizer, and chemical costs were taken from existing crop enterprise budgets published by Iowa State Extension or from enterprise budgets developed by Extension services at other universities.

The tool summarizes the costs and revenues of switchgrass, calculates the breakeven yields and/or prices for switchgrass production, and compares switchgrass returns to the return generated by the current enterprise on the field. It also provides a graph of the stream of returns from switchgrass and the current enterprise.

References

Hoque, M., Artz, G., and C. Hart. 2014. Estimated Cost of Establishment and Production of “Liberty” Switchgrass. Iowa State University Extension and Outreach, Ag Decision Maker, File A1-29.