

## Agriculture and Biofuels Issues: Cellulose, Greenhouse Gases, and EU and U.S. Policies

Wallace E. Tyner

A number of issues have arisen around the production of biofuels from agricultural products. These include evaluation of alternative policies, price impacts, environmental considerations, and land use. This agriculture and biofuels theme covers some very important topics ranging from local to global in scope.

The first paper by Farzad Taheripour and Wally Tyner provides an assessment of what these authors have learned in economics and policy research related to biofuels over the past four years. It covers the linkage between energy and agriculture, and the linkage between biofuels and commodity prices. It summarizes some of the important conclusions with respect to the impacts of various U.S. ethanol policy alternatives. In addition it covers the importance of the blending wall, surveys some important cellulose ethanol issues, and describes a bit of the work on global land use change impacts of U.S. and European Union (EU) biofuels policies.

The second paper by Tom Elam argues that biofuels policies in the United States need to be re-examined in light of the unintended consequences that have arisen over the past couple of years. In particular, he argues that the food cost increases may be a heavy price to pay for the relatively small energy gains.

The third paper by Madhu Khanna covers the economic prospects for and carbon mitigation potential of cellulosic biofuels. She concludes that cellulosic based fuels are likely to be more expensive than grain based ethanol. However, if environmental externalities are taken into consideration, the cellulosic based fuels become more competitive because of their advantages in reducing greenhouse gases and otherwise enhancing ecosystem services.

Finally, the fourth paper by Martin Banse, Hans van Meijl, and Geert Woltjer examines the consequences of EU biofuels policies on agricultural production and land use. They make use of a general equilibrium model to estimate

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the impacts of EU biofuels policies and programs and conclude that targeted EU biofuels consumption levels would have a strong impact on agriculture both in the EU and globally. Furthermore, they conclude that without mandatory blending, the EU targets cannot be achieved as the increased demand for feedstocks would pull up agricultural prices to the point that biofuels would be very expensive and blended fuel prices would not be competitive. So, clearly, these papers cover some of the most important issues in the biofuels arena today.

It is interesting to note that there are sometimes important differences among the papers both in terms of value estimates and conclusions. For example, Khanna has a cost estimate range for corn stover of \$82–\$101 per metric ton, whereas Taheripour and Tyner (from Brechbill and Tyner, cited in that paper) use an estimate of \$40 per short ton (about \$44 per metric ton). Most of that difference comes from the fact that Khanna included a land opportunity cost of \$34–\$36. per metric ton, but Taheripour and Tyner assumed the land rent would be attributed to the corn. Elam attributes much of the food/feed price impact to the ethanol subsidy and mandate, whereas Taheripour and Tyner argue that a large share of the corn price increase is linked

to the oil price increase. Banse, van Meijl, and Woltjer find somewhat different impacts of EU policies than Taheripour and Tyner, although the approaches used were somewhat different.

These kinds of differences are to be expected. Readers will find others. The differences arise because of differ-

ences in data, assumptions, methods, etc. A better sense of the basis for these differences will help improve our understanding of these complex issues. We hope that this *Choices* theme helps advance that understanding.

*Guest editor Wallace Tyner is Professor of Agricultural Economics, Purdue University.*