

A Nineteenth Century Farm With Twenty-First Technology – Back To The Food/Fiber/Fuel Future?



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The current high prices and projections of low carry-over stocks have rekindled the food vs. fuel debate. Certainly the ethanol industry, directly, and corn farmers, indirectly, will face increasing calls for lowering the renewable fuels mandate and a reduction in or elimination of the blenders tax credit. If there are planting problems this spring or weather/pollination problems this summer, the pressure for change will intensify.

As we listen to this debate, the implied assumption is that the sole purpose of farming is to provide food and certainly that has been true for over half a century. But if we look back at the nineteenth century, a different more complicated picture confronts us. At that time most farms had a woodlot that provided firewood for the farm household and maybe some to sell to townspeople.

In addition, the farm had a significant amount of its land dedicated to pastureland to provide food – energy – for the animals that were used to pull the implements used in farming and to pull the buggies, wagons, and sleighs that were used to go to town, school, and church. The draft animals were also fed oats and hay that was grown on the farm. Even the addition of steam tractors did little to change this structure as they were usually fueled with firewood.

But the introduction of the fossil fueled – oil, diesel, and gas – tractor was a game changer. Though the early models may have been exasperating to deal with, they were easier to take care of than draft animals. And, they could cover a lot more ground in a day.

Converting farm ground that was once used for energy production into cropland increased farm income so that by the end of WWII farmers were rapidly getting rid of their draft animals. As a result, most of the land was used either as pasture and hay ground for meat and milk production or as additional cropland. The conversion was complete and farms were places engaged in food production with energy being produced by oil wells, natural gas wells, coal mines, hydroelectric dams, and nuclear power plants.

As we know, low crop prices in the late 1990s greatly stimulated farmer interest in developing ethanol plants as a way to gain income by further processing a raw commodity as well as reduce the oversupply in the market that kept crop prices in the basement for four years. By the 2006-2007 period, the oversupply of grain of the late 1990s and first couple years of the 21st century vanished as increased numbers of ethanol plants began to come online. To compound things, crop productions outside the US reduced available supplies of grains.

By October 2007, prices had increased to the point that UN Special Rapporteur Jean Ziegler

told a news conference, “It’s a crime against humanity – it’s a crime against humanity to convert agricultural productive soil into soil...which will be burned into biofuel.” In addition, others computed land use changes into their calculations and argued that the production of biofuels actually resulted into more carbon dioxide being released into the atmosphere than occurred with the burning of gasoline.

Recently we ran across a paper and presentation by researchers at Michigan State University that suggest that we can return to a nineteenth century view of farming – our term, not their – as a place that produces food, fiber, and fuel but to fuel vehicles not horses. These documents can be accessed at http://www.espp.msu.edu/climatechange/presentations/symppt-bryan_bals.pdf and <http://ourenergypolicy.org/docs/2/es101864b.pdf>. The authors argue that the further addition of fuel to agriculture’s output configuration can be done with a more “efficient” use of existing agricultural resources; and with the use of appropriate technology could decrease carbon dioxide emission and increase the carbon content of agricultural soils.

They note that most agricultural land in the US is “used for animal feed, NOT direct human consumption.” They assert that “cropland is currently not used efficiently; we actually have more than enough land.” Their solution is to identify new technologies for animal feed and improved productivity of land.”

The Michigan State researchers consider several new technologies as a part of their analysis: “ammonia fiber expansion (AFES) pretreatment to produce highly digestible (by ruminants) cellulosic biomass and leaf protein concentrate (LPC) production.” Without going into details, these technologies produce both animal feeds (that meet the “three feed requirements – digestible energy (calories), protein, and rough fiber”) and feedstock for cellulosic production from corn grain, corn stover, and cellulosic biomass crops. They also plan on the double cropping of about one-third of the land.

Using these technologies, their analysis shows that in the US we can produce ethanol that meets 80 percent of the energy equivalent of imported crude oil while also producing the same amount of animal feed now consumed in the US. In addition this technology would remove 670 Tg of carbon dioxide equivalent per year from the atmosphere.

They conclude: “The U.S. is the world’s largest petroleum user and also a significant exporter of agricultural commodities. Our analysis shows that the U.S. can produce very large amounts of biofuels, maintain domestic food supplies, continue our contribution to international food supplies, increase soil fertility, and significantly reduce [greenhouse gasses]. If so, then integrating biofuel production with animal feed production may also be a pathway available to many other countries. Resolving the apparent ‘food versus fuel’ conflict seems to be more a matter of making the right choices rather than hard resource and technical constraints. If we so choose, we can quite readily adapt our agricultural system to produce food, animal feed, and sustainable biofuels.” △

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