

Policy Pennings by Dr. Daryll E. Ray

Oil and the changes in agriculture

With US refineries running at full capacity, the recent Texas refinery explosion could put additional pressure on US gasoline and diesel prices for an indefinite period of time. This potential disruption in US supplies of fuel takes place just as refineries are ramping up supplies to meet the needs of the summer driving season. As spring arrives, agriculture's demand for fuel also increases dramatically. The degree to which this explosion will have an impact on US prices will depend on the severity of the damage and the extent of the impact on the refinery's productive capacity.

In last week's column we looked ahead to the coming season and the potential impact that higher energy prices will have on farmers in the short-term. Those include lower margins and lower profitability, pressuring farmers to get the most out of each tank of fuel that they put into their equipment. While facing higher fuel prices, the appearance of Asian Soybean Rust has the potential to put farmers in a no-win situation. Will the additional cost of spraying be less than the potential loss from the disease? Considering the tight margins, a miscalculation could have serious consequences.

At a time when we are looking at the potential impact of higher energy prices on this year's US agricultural production, we thought it would be interesting to take a moment to look at the transformation that was triggered by the introduction of farming equipment that ran on inexpensive fossil fuel supplies. This transformation began more than a century ago with the advent of the huge steam traction engines. Over time, these behemoths slowly gave way to the smaller, more adaptable tractors that became a symbol of mechanized US agriculture. In recent years, the smaller tractors have begun to give way to larger, articulated, four-wheel-drive machines that are as large as the steam traction engines of an earlier day.

This introduction of mechanical power onto the farm triggered a slow but steady decline in the use of draft animals. Today, with the exception of the Amish and similar groups, the major use of these animals is limited to ceremonial occasions and county fairs. The acreage that was used to grow the feed that was fed to the animals that powered US farms has, for the most part, been converted to the production of food crops. In 1900, the production of oats required over 30 million acres. Today oats are grown on less than 2 million acres. One of the results of the introduction of fossil-fuel-powered equipment onto US farms has been the conversion of a significant number of acres from energy production to food production.

Using fossil fuels to provide the power that runs the modern farm has, in large part, also been responsible for

the thinning out of farm neighborhoods. Purchasing a tractor meant that a farmer could work more ground in a day than he had been able to cover in a week with his Belgians. Farm size was no longer determined by the physical limitations of animal agriculture. To use their new equipment efficiently, farmers began to rent and/or purchase land from their neighbors. Many of these neighbors then moved out, going to work in the factories that were sprouting up in places like Detroit and Moline. The increased use of fossil fuels brought with it the substitution of mechanical power for human power.

One could even argue that the specialization that is seen on today's farms is a consequence of the revolution that was brought on by introduction of fossil fuels into US agriculture. As long as one had to put up with sometimes-cantankerous horses and mules, one might as well have cattle, sheep, and hogs. But, with horses no longer necessary, some farmers were more than happy to get rid of all livestock. The hassles of dealing with livestock, along with the increased efficiencies scale, resulted in a significant number of farmers concentrating their efforts exclusively on grain production while their neighbors began to raise larger and larger numbers of food animals.

The fossil fuel driven revolution in US agriculture brought with it an increasing dependence upon purchased inputs. The energy that once came from the back forty, now comes in a bulk fuel truck. Without the manure provided by animals, crop farmers purchase their fertilizer from their local cooperative, fertilizer dealer, or elevator. Where once the farmer bred his mare to replace an old piece of "power equipment," he now goes to town and to purchase a new tractor.

Will increasing fuel prices drive a revolution as significant as the one that transformed US agriculture over the last century? From this vantage point, it is hard to see what that revolution would look like. On the other hand, in 1900 it would have been difficult to predict the agricultural changes that took place during the twentieth century.

Daryll E. Ray holds the Blasingame Chair of Excellence in Agricultural Policy, Institute of Agriculture, University of Tennessee, and is the Director of the UT's Agricultural Policy Analysis Center. (865) 974-7407; Fax: (865) 974-7298; dray@utk.edu; <http://agpolicy.org>. Daryll Ray's column is written with the research and assistance of Harwood D. Schaffer, Research Associate with APAC.

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