

September 24, 2007

## The Role of R&D in Agriculture and Related Industries: Today and Tomorrow

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### Opening Remarks

It is fitting that we gather here today in Chicago to discuss the Midwest region's emergent economy as it relates to agriculture. For across the street, atop the former Board of Trade Building, now the CME group, Ceres, the Greek goddess of the harvest, shines down on us through the sunshine. Almost from its inception, Chicago has been the nexus and commercial center for a broader region whose wealth emanates from production agriculture. From pigs running along the banks of the River, to the neighborhood workers at Cyrus McCormick's factories and the Union Stockyards, the city's economy has developed from the growing and trading of wheat and corn into the creation and trading of contracts based on notional value of commodities (and later financial instruments) that do not yet even exist.

Over the course of this progress, and especially in recent decades, not all has been well in the communities that have grown up around production agriculture. In its drive toward greater

productivity, the region has put much of itself out of business even as it has lifted standards of living for Americans and for much of the world. Fantastic productivity gains have meant ever more grain at ever lower prices in the countryside. Labor savings on the farm as meant fewer rural jobs directly in production agriculture. True, related jobs downstream in manufacturing, business services, and distribution have partly offset job and income loss stemming from productivity gains in production agriculture, but these have not been sufficient to sustain many Midwest communities at parity with U.S. living standards.

This brings me to the important topic of today's discussion concerning "The Role of R&D in Agriculture and Related Industries." Not so long ago, following the recession of 2001, our Research Department conducted an extensive study of manufacturing in the Midwest and in the U.S. One of our findings was that, while manufacturing *production* jobs were found to be waning in many industries and their communities, R&D taking place and funded by the manufacturing retained an outsized importance in our economy. For example, while the manufacturing sector accounts for less than 10 percent of total U.S. payroll employment, manufacturing companies continue to fund over one-half of the nation's industrial R&D and over 90 percent of U.S. patents. New products and processes to service

mankind's ever-present needs and wants continued to arise disproportionately from the creative impulses of manufacturing companies and from those R&D companies with which they contracted.

And so, from the Midwest region's perspective, the continued importance of such R&D has come to be a key sector in sustaining jobs and income. Strategic R&D alliances among the region's companies and with its universities continue to keep parts of the Midwest economy vibrant. These points of vibrancy particularly include such industries as pharmaceuticals, medical equipment and instruments, construction machinery, automotive, metal, and agricultural equipment and machinery.

However, even in these successful instances, the issue of whether the Midwest will retain R&D activities and creative activities over the long term remains precarious and uncertain. Regional economists have found that, historically, those regions that lose production very often subsequently lose their attendant R&D activities as well...if not at once, then "later on" as the strategic advantage of mutual proximity between the lab and the factory or farm is dissolved.

Will the creative and research activities associated with agriculture also suffer such a fate? There are fundamental reasons for optimism. For one, production agriculture is rooted so to speak

in the American Midwest in a way that manufacturing has not been in some instances. At heart, production agriculture must remain in the Midwest where land, climate and transportation infrastructure are superior.

Accordingly, in the American Midwest, the fixed natural resource nature of production lends a spillover competitive advantage in retaining and growing agriculture-related R&D within the region. More compelling still, the region has built a strong regional legacy of R&D and other creative activities centered or emanating from production agriculture. Our land grant and other major research universities—as well as government labs and fledgling biotech firms—continue to be among world leaders in “ag-bio” basic research and, increasingly, in forging strategic alliances with food-related manufacturers and more recently, with energy companies in development and commercialization of emerging technologies.

The benefits accruing from this relationship from farm to lab and factory is far from one-way. That is to say, breakthrough technologies in the lab may be capable, of more than producing more grain per unit of input...the result of which has ultimately lowered commodity prices over the long run. In particular, some of today’s technological efforts are directed at finding more valuable uses for crops...in energy, pharmaceuticals, and

materials. Such R&D activities, then, promise to raise prices in production agriculture, along with farm incomes and downstream employment and population.

And so, I am optimistic here today that the dissolution between research lab and factory and farm that has taken place in other regions and in other industries is not our Midwest region's destiny. At the end of the day, I expect that we will be more informed and confident of this promise, and more prepared to see it through in the years ahead.