

Food and Agriculture – Critical Links to Our Shared Future

Slide 1:

It is a pleasure for me to welcome this Illinois Food and Agriculture Summit to the Chicago campus of the University of Illinois.

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If you are not familiar with this campus, there are 27,000 students enrolled here.

In addition to the comprehensive undergraduate and graduate programs you would expect on a major university campus,

We operate the largest and most diverse medical college in the country, half of the dentists in Illinois are graduates of our dental college and both the college of nursing and pharmacy are ranked in the top 10 nationally.

And...it is a place where lives are being transformed. Over half of our students are the first in their family to ever attend college.

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We are meeting in one of the great cities of the world - a city and in a state that has had extraordinary impact on the world's food and agricultural systems.

Before becoming a full-time bureaucrat, I spent my professional career working in food and agriculture, first as a professor of swine nutrition and management, before becoming the head of Animal Sciences and later the Dean of the College of Agricultural, Consumer and Environmental Sciences at the University of Illinois.

It is good to be dealing with a familiar topic.....

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We are in a rapidly changing world.... a world where Midwestern agriculture and the food-related industries have to adapt by creating new opportunities.

There will be, as there has been in the past -- a global center for the world's food and agricultural system.

For much of the past century we have been that hub for technology, for risk management, for food manufacturing....

Our goal should be nothing less that retaining that position of preeminence and leadership

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It is more than farming....the food and agricultural system is a complex, highly integrated enterprise.... It is above all else - a very large set of connected business enterprises.

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To be clear-- this conversation is about wealth creation and jobs...across the breath of the food and agricultural system. It is about economic development.

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Sometime last spring, Phil Nelson, Illinois Farm Bureau President, and I were in University of Illinois Board Chairman Chris Kennedy's office at the Merchandise Mart.

At some point, Chris started pulling plans off the shelf-- The World Business Chicago - Plan for Economic Growth and Development, the OECD Territorial Review of the Chicago Tri-State Metropolitan Area and so on...

He then said..."Where's the plan for Illinois agriculture?"

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The response was that in 2007 the U of I, Illinois Farm Bureau and the Illinois Department of Agriculture had already come together to produce the “Vision for Illinois Agriculture.”

That plan focused on production agriculture, emerging bio-based industries, and to a limited extent, food manufacturing.

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Good did come from the work

- Advocacy for workforce development in agriculture,
- Emphasis on the need for public agricultural research,
- Efforts to address regulatory burdens on agriculture,
- Illinois’s business climate for agriculture

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But this conversation is much broader than rural, downstate Illinois...

It is important all who share a common interest in the overall vitality of life and work in the Prairie State.

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Chicago is a great, global city, and the Illinois food system critical to the well-being of our nation..

Let me put the Illinois food and agriculture system in some perspective.

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In its natural state, Illinois was mostly tall-grass prairie.

For centuries people have been attracted to this land, because of its temperate climate, adequate precipitation, and the soils that had formed beneath the prairie vegetation that followed centuries of glaciation.

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The combination of soils and climate found in the US Midwest is almost unique in the world.

The brown color denotes soils with no problems - in contrast much of Africa and South America are pink denoting acidic soils.....a challenge for those who farm them.

And, much of the brown is in regions, such as the Canadian prairies or Ukrainian and Russian plains, where climate does not favor high yielding agriculture.

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Native Americans developed highly productive agriculture before the arrival of European colonists.

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(Click 1) This land was unlike the tired and rocky ground found on the Eastern seaboard or in much of Europe,

(Click 2) and the rivers and inland seas made it accessible to our early pioneers.

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In the 19th century Europeans settled this land from the confluence of the Ohio and Mississippi Rivers to Chicago

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...And with the advent of railroads this location on the banks of the Chicago River and the shores of Lake Michigan became the epi-center of the great Midwest..

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But perhaps more amazing is how we went from subsistence farming to modern precision agriculture in the span of a century. Innovation was central to that transition...

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We can cite early milestones of innovation in Illinois that include:

- John Deere's invention of the steel plow in 1837.
- the McCormick Harvesting Machine Company opened in Chicago in 1847.
- Establishment of the Chicago Board of Trade, the opening of the Illinois and Michigan Canal
- completion of the Galena & Chicago Union Railroad line in 1848.
- Listing of the first standardized 'exchange traded' forward contracts by the CBOT in 1864.
- The first modern large-scale meatpacking plant built in Chicago by Philip Armour in 1867.
- Establishment of retail catalogue sales by Montgomery Ward in 1872.
- Founding of the Barb Fence Company by Joseph Glidden and Isaac Elwood in DeKalb in 1874.

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I could also go on at length about the innovative contributions of the Illinois Agricultural Experiment Station

– the fundamental concept of hybrid corn was developed by Professor

East during his tenure at the UI... it was commercialized by the likes of the

Funk Brothers, Lester Pfister and Dekalb AgResearch

—or industrial scale corn and soybean processing that began in our

laboratories and was commercialized by the Staley Manufacturing

Company and others

I can argue that modern, global agriculture was in significant part “made in

Illinois”

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But agriculture has changed over the years... to emphasize two crops – corn and soybeans.

Wheat and oats have declined as has livestock production—once a mainstay of rural farms and a source of employment for many....

It is just a fact that for more than a decade surrounding states have for some time been more welcoming to livestock agriculture.

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Innovation in agriculture and related systems has bred success for Illinois's business and commerce

There is a mutual dependency between rural and urban Illinois, deeply rooted in

- grain and livestock markets,
- finance and banking,
- retail sales,
- machinery manufacturing and distribution,
- food processing,

and very importantly, the cultural amenities that are provided by the city

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(Click 1) Today, primary agricultural output accounts for only about 1% of the GDP of Illinois's \$700 billion economy

(Click 2) manufacturing and real estate are the leading contributors to the state's GDP at 11-12% but,

—food and agriculture is deeply intertwined with these and most major sectors of the Illinois economy.

(Click 3) While Illinois has only about 76,000 farming operations today, far more jobs in the state are connected to the food and agriculture economy.

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Illinois is home to over 900 food manufacturing companies, adding over \$13 billion annually to the state's economy.

Employment for a million Illinoisans is in some way directly related to food and agriculture.

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You might think of this network of highly connected enterprises as a “constellation” of players both upstream and downstream from agriculture.

Indeed, if you look at the list of Fortune 500 companies that call Illinois home, several are clearly in the food and agriculture constellation today:

ADM,

Deere,

McDonald's,

Kraft,

Hillshire,

Ingredion,

and CF Industries

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Over the last several years, agriculture and related industries have given gave us one of the few positive economic stories.

Based on strong international demand for corn and soy and the growing biofuels industry

And, supported by timely adoption of productive and efficient technological innovations

—The balance sheets for those in the food and agriculture system have largely been positive and growing

-And this is reflected in the substantial increase in farmland value and cash rents for agricultural land in Illinois and the Midwest.

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Illinois has incredible strategic assets for continued leadership in food and agriculture.

- Nearly 80% of the state's landmass is cropland –
- Million acres and almost 90% of it is considered to be prime farm land
- Illinois is at the nexus of the nation's rail systems, served by over 50 railroads,
- and Chicago is the largest rail center in the United States.
- Only two states have more interstate highway miles than Illinois.
- Efficient, low-cost access to ocean ports is enabled on more than 1,100 miles of navigable waterways that border or flow through the state.
- Chicago's O'Hare International Airport and other aviation facilities in carry millions of tons of air cargo literally connect us to the global

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Greater Chicago is itself a major market for food and agricultural products
But of even greater importance is global market access—enabled by the
infrastructure and institutions located here— the exchanges, banks,
investment firms

– and a key resource, people in abundance who can effectively manage
the myriad of tasks in a global food system.

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-Innovation and aggressive entrepreneurship in food and agriculture has been the secret of our success....

-If you don't believe that, read the story of how Armour captured the east coast market for meat with the invent of refrigerated shipping by rail... and a century later how Iowa Beef changed the paradigm again with "boxed" beef.

-The rate of innovation and the rate of adoption are accelerating fueled by instant communications.

-We are home to some of the world's great research institutions

—but others, around the world, want to compete in that game—and are investing heavily.

America's land-grant model of learning, discovery research, and extension outreach is the envy of the world –

-But we also need recalibrate that model for the 21st century

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—and we need to be smart about minimizing the constraints and liberating the resources to allow innovators and entrepreneurs to create our pathways to future success.

The September 7th issue of the Economist carried a commentary entitled, “Farming as Rocket Science”.

It pointed to 4-H and our culture of “can-do” innovation in food and agriculture.

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When I was the Dean of Agriculture at the University of Illinois, I challenged our faculty to strive for: “Global Preeminence and Local Relevance”.

While that was intended to motivate us as a college, it also reflected this truth:

Challenges which have global significance – require solutions that are applied in local situations.

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We know:

-The human population of the world will grow to 9 billion by 2050, most rapidly in Asia and Africa and mainly in urban centers.

-Food demand for this widely diverse population is going to require twice the current level of food production.

-And rising incomes in the developing world are leading to improved diets and more demand for animal protein and higher quality foods.

Interest in food security is leading to efforts by some nations to secure sources and supply chains.

-Google if you will the phrase.... “Land Grab” to see the extent to which sovereign nations seek to guarantee availability of food through long-term

land leases. For example, Singapore has just established a large presence in Jilin Province in northern China

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Rising energy demand, to drive modernizing economies across the globe, will be met by innovative renewable sources and by new extraction technologies

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Water resources will be scarcer and more costly, requiring rational solutions for the use of our water supplies.

Arable land to expand food production is also very limited, and often far from the world's biggest markets.

Weather introduces annually occurring variables for agriculture, and climate changes lead to longer-term uncertainty.

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The market place has changed...Consumers are more invested in health and wellness, linked to nutrition,

And they want more say in sustainable production practices all the while expecting greater convenience.

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Every one of these challenges is interdisciplinary.

And everyone else – in some manner – is attempting to work on the same global challenges.

Knowledge is mobile and competition is fierce.

But there are challenges at home.

- business conditions, industry fragmentation, public policies and regulations, talent acquisition and workforce development, and the capacity for innovation.

Or, as Chris Kennedy said... What's the plan?

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If you have been on our Urbana campus recently, you may have noticed a new building that now houses Blue Waters, one of the most powerful supercomputers in the world.

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Scientists and engineers use the power of Blue Waters to tackle a wide range of challenging problems, from predicting the behavior of complex biological systems to simulating the evolution of the cosmos.

Such problems represent the huge challenges and opportunities in the world of “Big Data” —how to analyze and use massive amounts of data to gain knowledge and useful insights – from production to consumer behavior

There will be a global center for Information Technology in agriculture and by all rights it should be in Illinois.

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Here in Chicago, UI LABS is a bold proposal for a research and development laboratory that connects scientists from universities with their industry counterparts in an environment that facilitates nimbleness and protection of intellectual property... It is modeled after the philosophy of Bell Labs

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The first effort at UI LABS already underway.

the University of Illinois is leading the effort to capture a 70 million federal grant to create a regional hub in the National Network for Manufacturing Innovation.

-We are joined by Northwestern, Michigan, Purdue, Wisconsin and others—along with industry partners

-but the base is right here in Chicago, and industry partners across the country.

If successful, the Digital Manufacturing and Design Innovation institute (DMDI) create a foundation for breakthroughs related to systems design and information technology.

Food systems and networks could be beneficiaries.

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We have tools and opportunities that we could never imagine in the past, to create a future of innovation in Illinois food and agriculture.

That brings me back to my original point.

The ingenuity of people across the spectrum in Illinois, from metropolitan Chicago to the rural interests of downstate agriculture, will have to be employed in concert to tackle many of the issues that we face

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Agriculture in geographically fixed....we are "all in." The question is where do we go.....

Perhaps biased--- I have the view that the food and agriculture system can be vital to the future of our state, region and nation.

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Jim Duderstadt, President Emeritus of the University of Michigan recently put together a report on higher education for the Chicago Council on Global In it he said....

“The future of the Midwest region no longer depends on our factories and farms or a labor force possessing physical strength and determination, but limited skills and education.

Nor will our region’s remarkable natural resources, our forests and fertile fields, our rivers and inland seas, determine our future.

From here on out, our future depends on how well we develop our human resources and how we create and apply new knowledge through innovation and entrepreneurial zeal.”

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I am envious of other players.....

Almost 30 years ago the leadership at Monsanto made a decision to shift emphasis from chemicals used in agriculture to genomic technology...

And government and educational leaders in St. Louis came together to foster a revolution in agricultural biotechnology.

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On Thursday of last week Robb Fraley of Monsanto received the World Food Prize (the Nobel of Agriculture); along with Mary-Dell Chilton, Founder of Syngenta Biotechnology, which happens to be located in Research Triangle, North Carolina....

Both Robb and Mary-Dell earned their doctorates from the University of Illinois, Urbana-Champaign. We gave them the tools.

There will be a next revolution in global agriculture and I suspect that it will involve information technology-- an area where the faculty at Urbana-Champaign is globally preeminent.

I just hope that 30 years from now we're not celebrating the bittersweet success of our alums who took our tools to another part of the world to create great economic growth and new jobs.

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We have work to do... thanks for your attention.