

Die Land- und Ernährungswirtschaft in 75 Jahren.

Im Rahmen seiner Jubiläums-Delegiertenversammlung 75 Jahre LID vom 17. Oktober 2012 in St. Gallen veranstaltete der Landwirtschaftliche Informationsdienst LID ein Podiumsgespräch mit Chefredaktoren.

Es gilt das gesprochene Wort.

Global food: the next 75 years

By Mike Wilson, Executive Editor, Farm Futures, Decatur, Illinois USA /
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Ladies and gentlemen, Markus, LID organizers, honored guests:

First let me offer congratulations on your anniversary, and thank you for this opportunity to be here to celebrate the past even as we look ahead at the challenges we face in the next 75 years.

I am an agricultural journalist who grew up on a livestock and grain farm in Illinois. I'm lucky to have married my wife Molly, who was fortunate to have worked on a Swiss dairy farm near Unterstammheim, as an exchange student. Molly and I have been longtime friends with these Swiss farmers, Ruth and Hansrudi Langhart and their family. For the past 30 years or so, we have frequently visited the farm and gotten to know what it's like to live and work on a Swiss dairy, which has now been converted to a Natura beef farm. So, happily I can say I have some understanding of a working Swiss farm and the challenges you face.

The American perspective

Markus asked me to give a brief perspective on American agriculture, which, right now is doing very well, despite a very difficult drought this year. This prosperity has happened even as our general economy has suffered severe recession.

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Prosperous times - U.S. grain farmers enjoy good demand for commodities on both domestic and global markets. Their farms are at a scale that allows them good profit margins. Low interest rates make capital less expensive; a cheap dollar makes our exports attractive, especially to emerging markets like China. This year USDA expects record farm exports. The domestic biofuel industry is anchored by a government mandate to include renewable fuels in its energy mix; this market provides a floor for corn prices. Risk management tools like forward contracting allow farmers to capture best prices throughout the year. While the worst drought in 70 years cut grain production this summer, most of our farmers have federally-subsidized crop insurance, which will actually lead to record farm income for 2012.

Demand destruction - The challenge we face now short term is how to handle demand destruction resulting from the drought and high grain prices. Both domestic and international buyers of grain have started rationing their purchases and switching to alternative feedstocks, such as feed wheat instead of corn. When this happens, you're never sure that demand for corn will return; thus, we call it demand destruction. Go online today at www.farmfutures.com and you will see our stories saying world grain buyers are canceling purchases; it's difficult to buy when the market prices are so high, despite the cheap dollar.

Likewise, high grain prices are taking a toll on the livestock sector; we've had several cattle and hog herds liquidated; again, once a livestock producer quits the business, you cannot assume he will return to the business when feed prices come down.

Food vs. fuel - The drought re-energized the food vs. fuel debate. A couple points to make on this issue: first, while normally 40% of U.S. corn is used for ethanol, that number gets lowered in times of drought because corn prices are too high to make ethanol; some of our ethanol plants are idled now. Second, that 40% is misleading because it does not take into account the Dried Distilled Grains (DDGs) that come out of the ethanol process. These DDGs are rapidly growing as an excellent feed source for cattle; the U.S. is selling DDGs now to livestock growers both domestic and overseas. That brings that 40% number down to less than 30% in terms of actual corn being used in the biofuel industry. And even with this historically difficult drought, America will still produce as much corn this year as it did in 2006 thanks to improving seed technology.

Threats to U.S. agriculture

Economic recovery: As the U.S. economy recovers, interest rates and inflation will likely go higher. That is a threat to any small business that often relies on borrowed money, as agriculture does. Economists also see the dollar strengthening, which would damage U.S. farm exports.

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Misled consumers: There is a growing number of consumers who are two or three generations removed from any farm experience. They want to learn how their food is produced, but they don't always like what they learn. Without good communication from farmers, these consumers often gravitate toward special interests such as animal rights or environmental extremists. Organic, or bio food, is a great niche market, but if we are talking about food for all in the next 75 years, organic will not feed everyone. This is not universally understood by the voting public.

Today in the U.S. we have major retailers like Walmart, Burger King and McDonalds – major customers for American livestock – in effect making decisions on how livestock should be grown, regardless of any science or research that might say otherwise. Agriculture may need to adapt to new production restrictions or simply abandon proven production methods, and that would harm our ability to feed everyone in the future.

Consumers are hard to predict. America is the world's largest global food aid donor. But if you ask American consumers in surveys about our country's role in feeding the world, they are ambivalent; a majority of them don't care if American farmers help feed the world, as long as they have a cheap and safe food supply.

Government: Right now, the U.S. farmer enjoys a minimal amount of intrusion from its government. We have a renewable fuel policy that is driving corn demand, and we have federally-subsidized crop insurance that is keeping most farmers in business despite this past year's drought. We have a Conservation Reserve program that allows landowners to 'retire' land that is highly erodible and get a payment from the government. But today our congress is dysfunctional. Bipartisan differences based on taxes and federal deficits mean it is very difficult to get consensus on urgent matters like national farm policy. So, where will these policies be in the future? We don't know.

Global challenges

How do we feed a world that will have 9 billion people by 2050? More important, how do we do it without harming our food-producing resource base – water, soils and climate that we depend on to feed us now, and indefinitely?

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Start with population growth. It's estimated every second of the day five people are born on the planet. Every second two people die, with a net gain of three every second. That's 7.7 million more people each month. In a year's time, we add 90 million people – more than the population of Germany, or Egypt, or Vietnam.

Demographers expect nearly all of the population growth in the next 40 years to come in developing countries, particularly Africa and Asia. Today 25 million babies are born in India each year; 17 million in China. Annual births in the U.S., by comparison, are around 4.3 million.

Today there are one billion people who do not have access to a safe and adequate food supply. In fact, around 20 percent of the world's population lives on less than \$1.25 per day and many of them are children who suffer from severe long-term health problems resulting from inadequate nutrition.

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Rising middle class: It's not just how many more people are arriving on this planet; it's what those people will demand as consumers. Countries like India and China are seeing rapid economic growth. The World Bank estimates the number of people in developing countries in households with incomes above \$16,000 per year will rise from 352 million in 2000 to 2.1 billion by 2030. What is the first thing people with more income do? They improve their diet. They switch from just rice or beans to rice plus chicken or pork.

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The number of people who escape poverty over the next 75 years is the key unknown in tomorrow's food scenario.

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Double production

When you combine predicted population growth with the increased demand in protein-based diets, the need for increased production becomes clear. According to the Food and Agriculture Organization total supply of food measured in kilocalories will need to increase by more than 170 percent to feed everyone by 2050. Food production will need to increase faster than any prior time in history.

A number of things need to happen. For industrialized nations, government and consumer policies need to change to allow robust commercial production, establish food security, and export capability. For developing nations, investment in everything from agronomy to processing, storage and markets must be boosted.

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Smallholder Agriculture

Tens of millions of smallholder African and Asian farmers need help in infrastructure, capital, markets and education to boost yields in dramatic fashion. This is where the greatest production gains must be realized. This year sub-Saharan African maize yields are projected to be 2.1 metric tons per hectare, less than half of world averages and a fourth of U.S. average yields. Political leaders in those countries must prioritize agriculture, establish political and economic stability, and agree to changes, such as private land ownership, to motivate growers and spark entrepreneurship.

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Circle of trust – Can outsiders help those farmers adopt better farming methods? Many have tried and many have failed. The Bill Gates Foundation uses a concept they call 'circles of trust' – they start with the outlook of a typical female African farmer with a farm smaller than a football field. Her village and family is her immediate 'circle of trust.' Educators operate within those circles of trust. One idea is called 'digital green,' where Gates volunteers film farmers talking about practices that work in one area, and show those short interviews to other farmers they trust. They're also using cellular phones to communicate and convey info that will increase productivity, all the while building her farm, with more animals, producing more, and allowing her to intersect with the outer rings where she can actually begin selling a surplus.

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We make a lot of positive assumptions when we talk about what it takes to help small holder farmers. Unfortunately, too often there is civil unrest, political upheaval, forced migration – all of this makes establishing a long-term productive agriculture sector more difficult.

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Sustainable, conservation farming

For farmers everywhere, sustainable practices and conservation should be the cornerstone of production. We must protect our natural resource base for the long haul. Today no-till and strip-till is practiced on 35 percent of

all U.S. crop acres; it should be double that. Brazilian farmers use no-till on 75% of row crop land, in part to mitigate soil loss and to keep seedbeds cool in tropical weather. Conservation practices like no-till can boost organic matter, which can reduce soil fertility costs. It can also help offset weather extremes from global warming.

Innovation is key to higher production

To grow 70% more food by 2050, world farmers must be allowed to use the best tools available to increase yields. Researchers must be encouraged to develop these tools. As an example just look at what Brazilian researchers did with the soybean in the late '70s. This did not happen by itself; it required the commitment by Brazilian government leaders to fund research. By finding a way to make a soybean plant grow in tropical soils it revolutionized agriculture.

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Robots: Today, innovations look at filling a need, such as labor shortages or handling jobs in less time. For commercial grain production it may mean adopting tools that allow more efficient harvest, such as the driverless tractor technology engineers are working on now at major equipment companies. A harvesting machine uses GPS to move a driverless tractor with grain wagon in to position to unload grain. Other engineers are developing robot tractors primarily for tillage.

Automation and robotics are already at the first stages of replacing hand labor for key functions like grape pruning and fruit picking. A company called Energid is a year away from commercializing a robotic device using cameras, computers and sensors that use octopus arms that pluck fruit from each orange tree, saving on labor and losses from poorly timed harvests.

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In America, agronomists are working to develop Pennycress, a non-edible winter oil crop that may someday become the primary feedstock for fuel, thus eliminating the food vs. fuel debate. We have been waiting for the second generation of biofuels, called cellulosic ethanol, but it is very slow in coming. However, six cellulosic ethanol plants are on track to open in the states next year. Some of them will use cornstalks, some will use woody biomass and another will use municipal solid waste. Again, if this succeeds it would calm the food vs. fuel debate.

Livestock bolus: In livestock, innovators are working on cheaper feeds through the use of enzymes, and immunity boosters based on algae. A company called Vital Herd is building a sensor the size of a D battery that will live inside a cow's rumen and take its temperature and other vital signs every five minutes; if there is any sign of sickness, the bolus sends a signal to a wireless internet device that alerts the herd manager or veterinarian. So the cow can be isolated from the rest of the herd before it shows any signs of illness such as shipping fever or bovine respiratory disease.

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Biotech: Biotechnology will continue to boost production on the millions of hectares where these crops are allowed to be grown. Biotech has helped boost yields and saved soil, mainly because glyphosate tolerant crops work well in no-till production. No-till also saves on field trips, so there has been a drop of 37% in energy needs where biotech crops are grown. And insecticide use is down 65% since 1987, again in part because biotech seed has a gene that can kill insects from within the plant.

Today we are seeing problems from over-reliance on this technology. Namely, when farmers plant a seed with the same gene over and over again, insects and weeds can become resistant, rendering the technology useless. This is the big story in American agriculture today.

Even so, biotech research is now giving us drought tolerant seed, which helped boost yields a little this year. In future it will give us crops that better utilize nitrogen, which will make maize production more sustainable. And, it will give us more nutritious food, like the golden rice that Swiss scientist Dr. Ingo Potrykus developed years

ago. If managed properly, genetically engineered crops could be the key to feeding the world's exploding population.

Conclusion

To conclude, I'd like to offer some broad ideas about what needs to happen for world farmers to meet the challenge of feeding the world in 2050 and beyond.

- First, nations that want to grow their agriculture should adopt government policies that allow producers to react to world market signals. This encourages innovation. Those governments should also take a second look at how over burdensome regulation may be killing the efficiency and productivity of their farming sector;
- Second, appropriate public and private investment must be made in smallholder agriculture, so that significant production increases can be realized in the regions where population growth will be highest. That includes multi-national agribusiness giants investing to make smallholder farming flourish, not just build shareholder value;
- Third, all farmers must be allowed to use appropriate and scientifically-sound technology available to them in their quest to grow yields. Embrace research, such as that conducted by EMBRAPA in Brazil, to adopt seed and crops to new climates and growing seasons;
- Fourth, in order to mitigate impacts of climate change and intensive production practices, governments should invest in research and adopt policies that encourage sustainability, such as cover crops and no-till. We need to keep our soil production factory working hundreds of years into the future;
- Fifth, work toward world consensus on more ag-friendly land use policies. We have a fixed amount of land to work with now; How can we increase production when we lose land every year to parking lots and shopping centers?

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The success of agriculture is astonishing, but we have new challenges that must be addressed, through research, policy change, and on-farm practices. The soil and its careful management is the fundamental foundation of our world. Addressing the food and nutrition needs of a growing population is the defining challenge of this century.

Thank you.

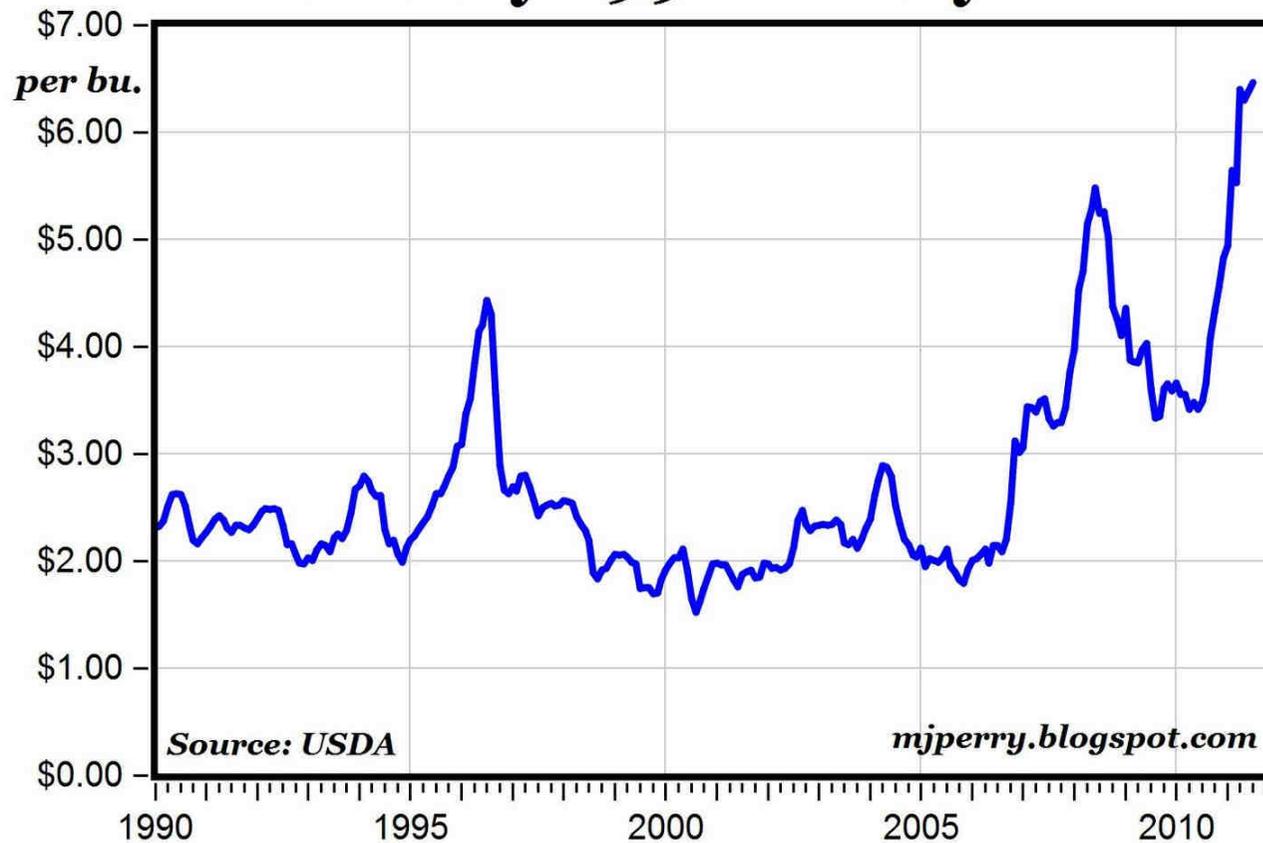
The Future of Food



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Prosperous times for U.S. Ag

U.S. Corn: Avg. Price to Farmers January 1990 to July 2011



Challenges now and in the future:



Farming practices based on consumer fears vs. research and science

Projected Population Growth

Region	2011	2050	Change	Percent
World	6,987	9,587	+2,600	+ 38
High Income	1,242	1,333	+ 91	+ 7
Low Income	5,745	8,254	+2,509	+ 44
East & S.E. Asia	2,183	2,308	+ 125	+ 6
South Central Asia	1,795	2,574	+ 779	+ 43
Sub-Saharan Africa	883	2,069	+1,186	+134
Lat. America/Carib	596	746	+ 150	+ 25
N. Africa & W. Asia	451	725	+ 274	+ 61

Source: Population Reference Bureau. [2011 World Population Data Sheet](#).

Projected World Food Demand

- World food demand to grow 70-80% by 2050
 - 40% increase from world population growth – from 7.0 to 9.6 billion – almost all in developing countries
 - 30-40% increase from broad-based economic growth in low income countries
- The World Bank has estimated the number of people in developing countries in households with incomes >\$16,000/year will rise from 352 million in 2000 to 2.1 billion by 2030.
- How many presently low income consumers escape from poverty is the *most important* uncertainty re future global demand for food.
- Policies that accelerate broad-based economic growth in LDCs reduce hunger, but unleash rapid growth in demand for agric. products.

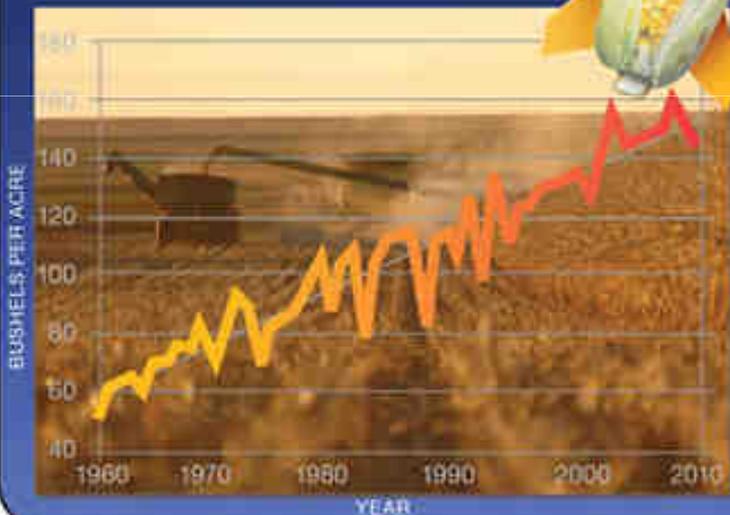
Dynamics of Food Demand Growth

- 1.4 billion people live on less than \$1.25/day
 - 1 billion cannot afford 1,800 calories per day.
- 2.6 billion people live on less than \$2.00/day
 - At \$2.00 per day most hunger (calorie) problems solved, but 1 billion still suffer nutritional deficiencies.
- As their incomes rise from about \$2 to \$10 per day, people eat more **meat, dairy products, eggs, edible oils**, fruits & vegetables causing rapid growth in raw ag commodity demand.
- After about \$10 per day, people buy more processing, services, packaging, variety, and luxury forms, but not more raw ag commodities.

Challenges now and in the future:

Yield Gaps

U.S. corn yields have trended higher since 1960. But many experts believe overall yield increases will slow in the coming years, widening the gap between supply and demand.



Yield gaps—the difference between yield potential and average farm yields—must be narrowed in order to boost food security. A wide range of yield gaps exists around the world, with average yields ranging from an estimated 20 to 80% of yield potential for wheat, rice and corn.

Annual Crop Production Growth %

	1969–99	1977/99–2015	2015–30
All Developing Countries	3.1	1.7	1.4
Industrial Countries	1.4	0.9	0.9
Transition Countries	-0.6	0.7	0.7
World	2.1	1.5	1.3

SOURCE: WWW.FARMDOCDAILY.ILLINOIS.EDU/

Producing enough food for 9 billion

Challenges now and in the future:



Developing economies: Gov. policies, farmer training, yields, markets, infrastructure, etc.

Challenges now and in the future:



Production systems that work for smallholder farmers in developing economies

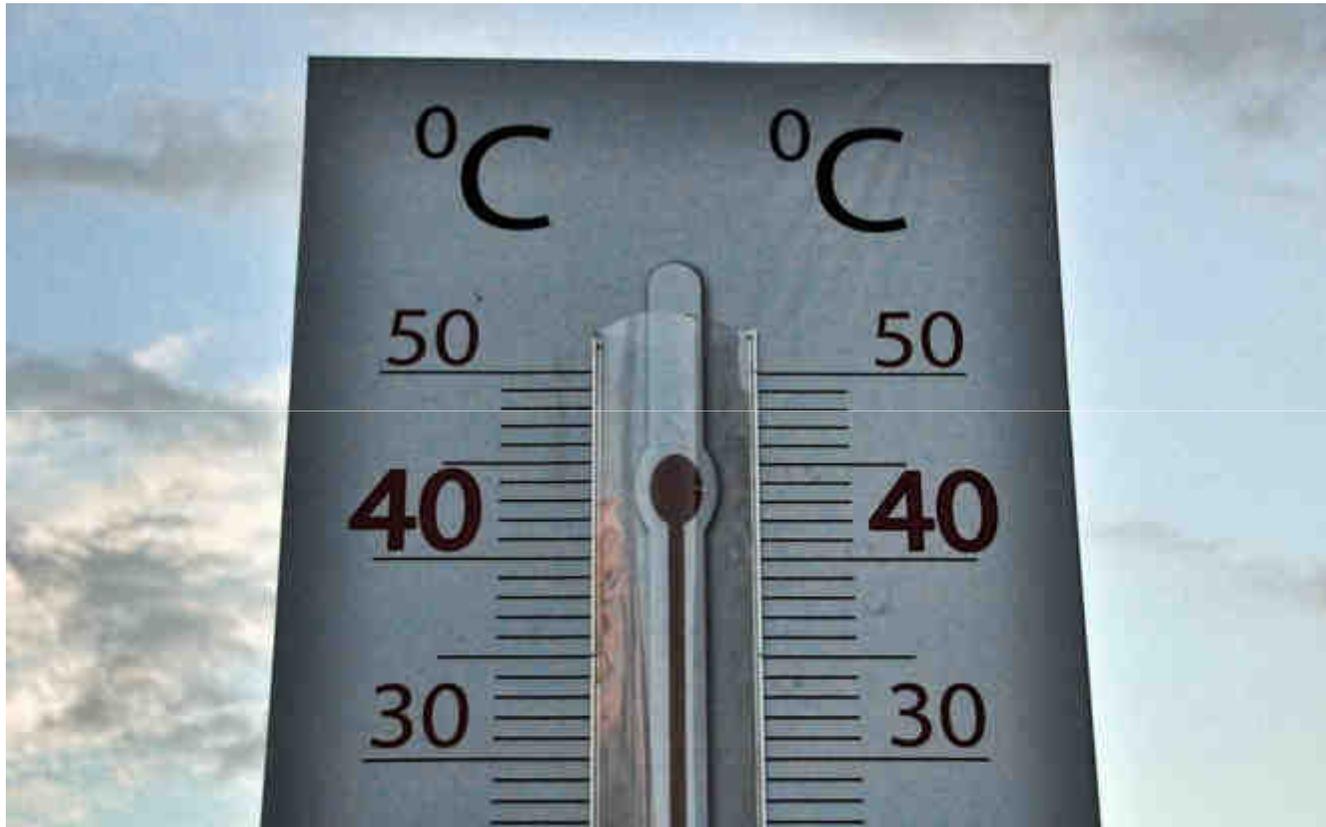
*80% of rural African people depend
on smallholder agriculture for their
livelihood*

Challenges now and in the future:



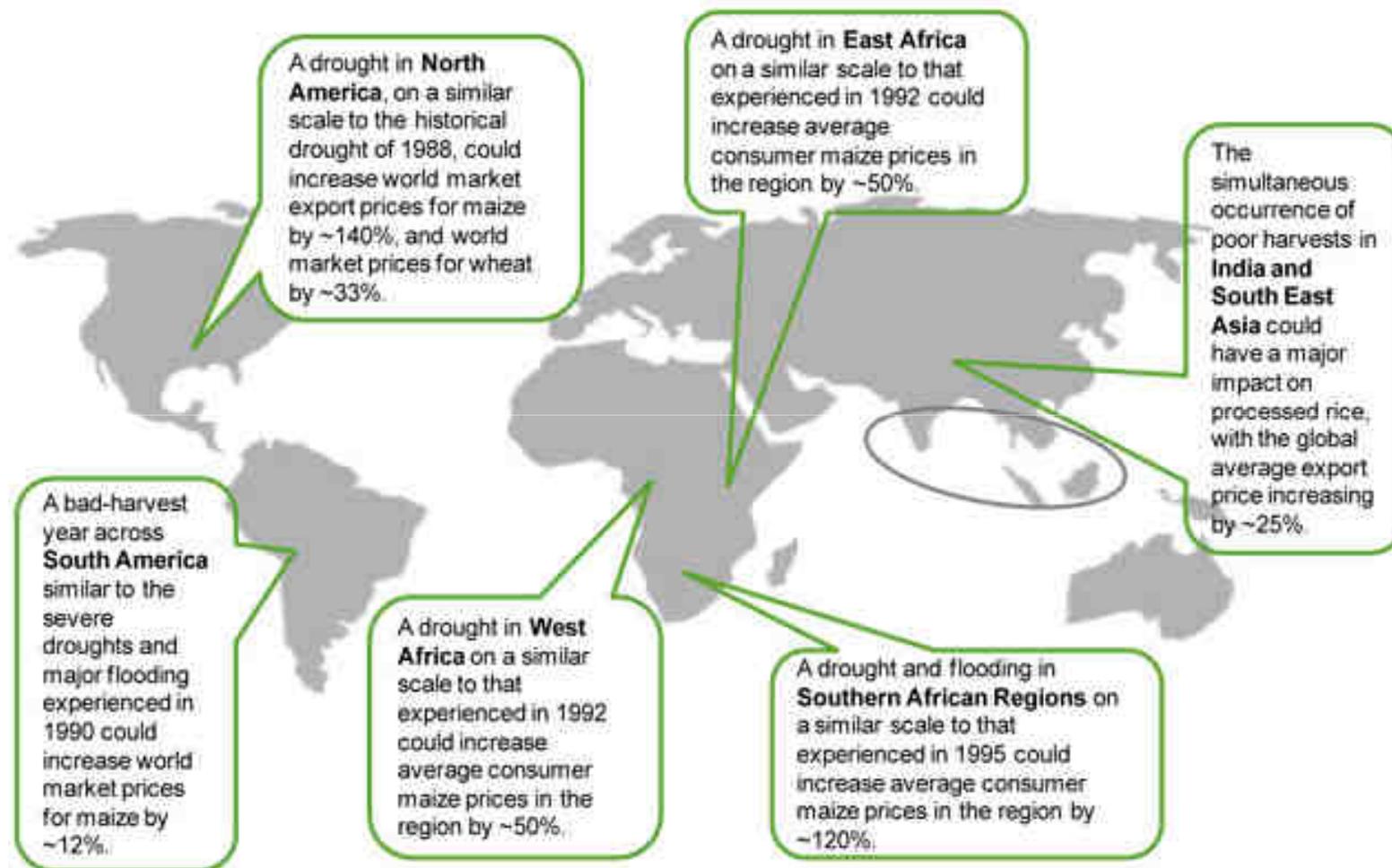
Political unrest

Challenges now and in the future:



Global warming (assuming it is real)

Challenges now and in the future:



Weather

Challenges now and in the future:

"We have historically been eroding our soil factory by destroying organic matter through tillage, wind, and water erosion. In 200 years of farming in the U.S., we have destroyed about half our organic matter." – *Dick Wittman, Idaho rancher and farm management consultant*

**Producing enough food for 9 billion
...in a sustainable way**

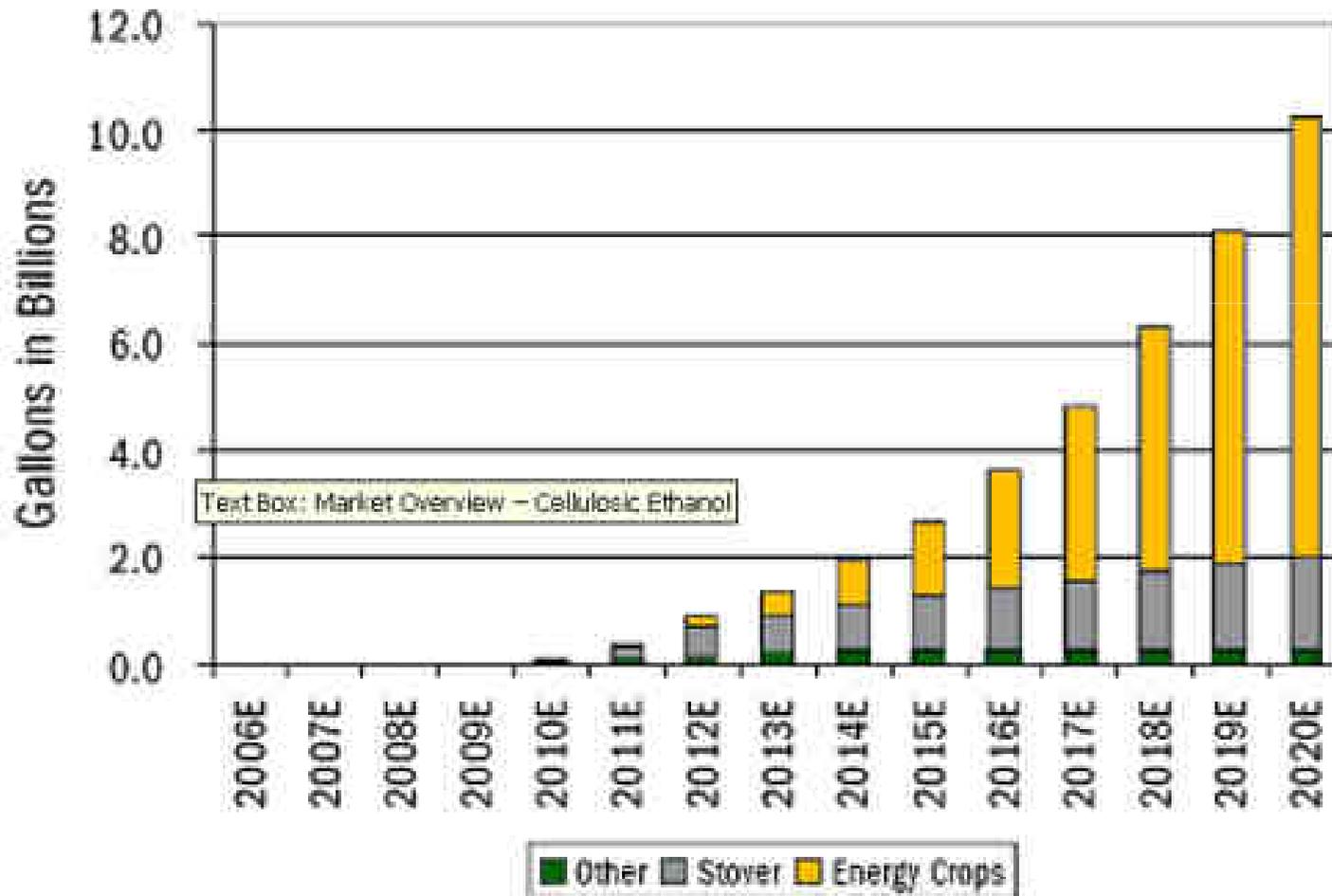
Challenges now and in the future: Adapting technology



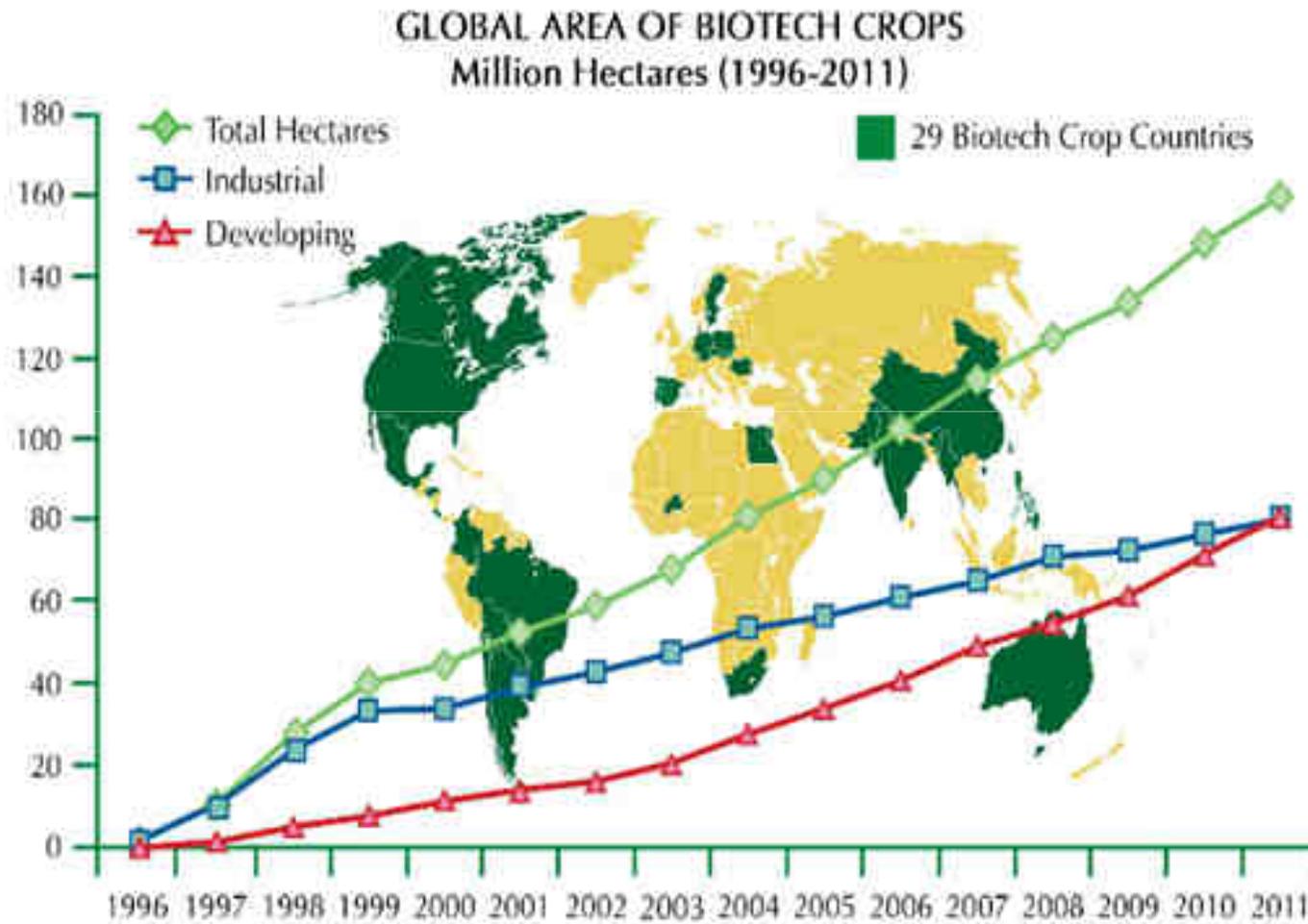
Robotics, automation

Food vs. Fuel debate

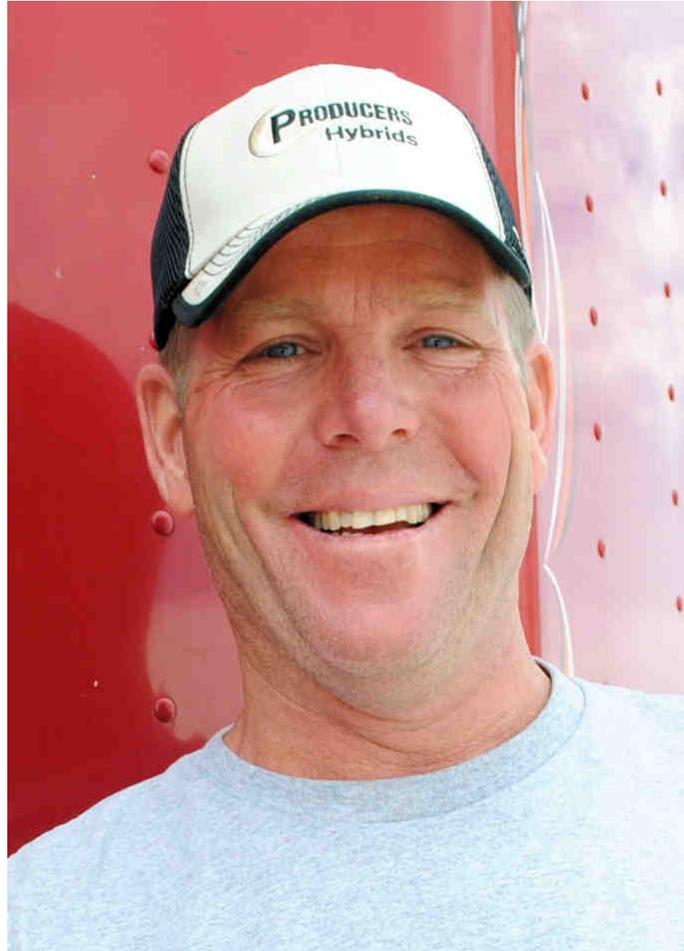
Cellulosic Ethanol Forecast



Biotech Crops



A record 16.7 million farmers, in 29 countries, planted 160 million hectares (395 million acres) in 2011, a sustained increase of 8% or 12 million hectares (30 million acres) over 2010.



- "We have a mission now, to continue growing more bushels on fewer acres, with less water and less fertilizer, and still feed a growing population. That mission has been thrust upon us by the public." – *Mark Jagels, Nebraska farmer*