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BUSINESS/FINANCIAL DESK

Sometimes a Bumper Crop Is Too Much of a Good Thing

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The first architects of agricultural subsidies aimed to bail out farmers during bad harvests so that they would not abandon the vital task of producing food for the nation.

But these days, not only are farmers overcoming droughts and floods, agricultural technologies are ushering them into an era of surging production that is likely to outstrip global demand for years to come.

This season's parched-earth conditions were supposed to spell doom here for the Illinois corn crop. Instead, the country's second-biggest corn-growing state harvested 16 percent more per acre than expected, helping the United States produce its second-largest crop ever.

The bountiful harvest, much of it likely to end up on world markets, has only added to a fundamental problem facing the sector: too much success for its own good. Despite the worst Midwest drought in 17 years, seed technology allowed farmers to continue their relentless increase in production.

That presages a challenge that will continue to dog farmers across the industrialized world and bureaucrats negotiating global trade agreements: how to sell ever-larger bumper crops, often increased by the latest genetic advancement, without causing too much economic pain in farm regions.

Even as businesses have cut employee benefits and have limited job security in the face of more intense global competition, governments in rich countries have clung to one of the oldest forms of trade protectionism: farm subsidies.

Manufacturers like Delphi and airlines like United and Northwest can and do file for bankruptcy and scale back their operations in a process that often enhances economic efficiency. But Washington, Tokyo and Brussels have spent heavily on subsidies for decades and have erected numerous other trade barriers to slow the demise of their farmers facing similar competitive pressures.

Some of these farm subsidies have reached extraordinary levels. Mark Vaile, Australia's trade minister, recently calculated that European Union subsidies work out to \$2.20 per cow per day; more than a billion people around the world live on less than that each day.

The subsidies have not retarded the advance of farm productivity, but food prices in poor countries tend to be much lower than in affluent countries. That is because the United States and European Union keep large quantities of food off the market at home each year to support prices for their farmers and sell the food instead at subsidized prices overseas or donate it as foreign aid.

These trade practices have prevented people in poor countries with rich soil from trying to export their way to prosperity with farm goods the way countries like South Korea and Japan have exported their way to prosperity with industrial goods.

The current round of global trade talks, which will include a ministerial conference in Hong Kong from Dec. 13 to 18 is supposed to address the problem but has stalled, mainly over French opposition to sharper curbs on European Union subsidies.

But the current system of subsidies faces another challenge: increasing yields from crop strains emerging from the laboratories at seed companies like Monsanto and the Pioneer Hi-Bred International unit of DuPont.

New crops, some produced through the breeding and grafting of existing strains and others through genetic manipulation, are increasing corn production in the United States and Europe every year. This is adding to surpluses, depressing global prices and driving up the costs of subsidies, which have already hit \$20 billion a year for trade-related subsidies alone in the United States, and almost \$85 billion a year in the European Union.

Individually, farmers welcome the new varieties of grain.

"As a grower I hate to admit it, but the people in the labs really helped us out this year," said Joe Zumwalt, a third-generation farmer here in western Illinois, near the Mississippi River. "If it weren't for the seed genetics they have been offering us the last few years, our yields and our outcome wouldn't have been nearly what they were."

But for farming communities as a whole, bumper crops can be bad news.

"Farmers really shoot themselves in the foot when they have a better crop," said Neal E. Harle, an agricultural economist at Iowa State University. "An increase in yield rewards the producer with a disproportionate drop in price and profitability; farmers would be better off if the whole crop got a haircut of 15 percent or so."

The difficulty in trying to obtain a deal limiting agricultural subsidies at the World Trade Organization ministerial conference in January in Hong Kong is that countries as varied as Japan, Switzerland, France and even the United States are each worried that their farmers of certain crops would be among the first to fail if subsidies were reduced.

Developing-country exporters of agricultural commodities like Brazil, Guatemala and Malaysia, meanwhile, are clamoring for the W.T.O. to halt moves by the United States and especially the European Union to limit the cost of their subsidies by dumping the excess food on world markets at low prices. Since 1996, American farmers have been encouraged by farm subsidy programs to produce flat out, knowing that government payments would cushion a severe drop in prices.

But lately, with large increases in corn yields becoming the norm rather than an aberration, corn prices have dropped to their lowest level since the late 1990's. Low prices, tepid exports and ample subsidy protections for farmers mean this could end up being the most expensive harvest ever for American taxpayers.

Groups like the National Corn Growers Association argue that the answer to overproduction lies in creating more demand through greater exports, which have proved elusive lately, and through building more plants that use corn to produce bio-diesel and ethanol fuels.

"We can provide this nation with a renewable source of energy all the time," said Jonathan Hofmeister, 35, a corn and soybean farmer who lives a few miles from Mr. Zumwalt.

But even as critics of the current system like Dr. Harle are pushing for limits on domestic subsidy payments to encourage farmers to curb their overproducing ways, they must contend with university researchers and big seed companies working feverishly to increase corn yields. The push the last 15 years has also been to make seeds able to retain more moisture so they can better withstand severe droughts. This past summer was the first real test of the newer drought-resistant seeds since the Midwest drought of 1988, seed company officials said.

That the seeds passed with high marks -- coming after the record 2004 American corn crop -- shows that corn production may have entered an era of even higher production.

As a result, the Green Revolution, including most recently the use of genetically engineered plants, is colliding with the international trade system. Rising crop yields in affluent countries, even in years with poor growing conditions, are producing more food than these countries' populations can eat.

Rather than let the market sort out the winners from the losers, condemning some less-efficient farmers to go broke or forcing them to switch to other crops, governments continue to subsidize them heavily. And the cost of these subsidies has spiraled higher with increasing yields.

Here in western Illinois, Mr. Zumwalt had expected corn yields of 120 to 130 bushels an acre because of the drought, but he ended up averaging 175 bushels. The cost to produce corn, meanwhile, has risen, he said, with fuel costs double what they were in 2004 and fertilizer 40 percent more expensive, in large part because of higher natural gas prices.

While Mr. Zumwalt, 26, gives plenty of credit to advancements in seed genetics, he is a modern-day example of how farmers have also increased efficiency through use of better equipment and water-management practices. He uses combines that rely on a global-positioning system to map exactly how much corn each acre of land is yielding, giving him critical information on how much fertilizer, seed and chemicals are needed for the next harvest.

Even with this year's Farm Belt drought, American corn yields have increased by 31 percent since 1995, and by 72 percent since 1975. In recent years, Europe, where much less corn is produced, has followed suit as the big companies have introduced newer seed varieties there as well.

Lately the development of new seeds has accelerated considerably. After two severe droughts in the 1980's, companies began pouring billions of dollars into seed research, particularly in corn, with the goal of developing hybrids that could more effectively capture moisture from the root system. The challenge was to create that tolerance without sacrificing yield.

In the 1990's corn breeders also began directing genetic technology developed in the human health industry into plant breeding. Breeders can now use DNA markers to study individual contributions from pieces of chromosome in the seed, allowing them to leverage multiple years of data.

Monsanto, DuPont and the Swiss company Syngenta, three of the largest seed players, have established multiseason nurseries in places like Hawaii, Chile and Argentina, where they can test up to four generations of a seed variety in one year.

"We can work 365 days a year without having an off-season," said William S. Niebur, DuPont's vice president for crop genetics research.

Syngenta has recently reorganized its scientific teams to keep up with the advances in genomics and other disciplines, said Ray Riley, head of global corn and soybean product development for Syngenta.

The result is that seed companies today are doubling the rate of genetic yield improvement in corn every year. Most recently, Monsanto, for example, claims its genetically modified seeds that limit the amount of corn root worm, a common problem in Illinois, have added at least nine bushels an acre.

"We don't see any signs that our ability to improve the yield of corn is diminishing," said Marlin Edwards, global head of breeding technology for Monsanto.

Those kinds of predictions make farmers like Mr. Zumwalt nervous about the prices their crops will fetch once conditions improve.

"We have just gotten too good at what we do, I guess," he said.

Photos: A silo in a harvested corn field in Ursa, Ill. Despite concerns about the effects of a summer drought, this year's crop was the second largest ever. (Photo by Dilip Vishwanat for The New York Times)(pg. C1); Corn sits in a 26,000-bushel storage bin on Jonathan Hofmeister's farm in Ursa, Ill.; Warren Speckhart at his 6,000-bushel grain bin in Ursa, Ill. Some farmers worry that the growing surpluses will drive prices down. (Photographs by Dilip Vishwanat for The New York Times)(pg. C5)

Chart: "More Productive"

The genetic engineering of seeds and improvements in growing techniques have led to a substantial rise in domestic corn yields.

Graph tracks bushels of corn per acre since 1975.

(Source by Agriculture Department)(pg. C5)

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