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**AGRICULTURAL POLICIES AFFECTING FERTILIZER  
DEMAND**

**by**

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**Cargill Fertilizer**

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## **Agricultural Policies Affecting U.S. Fertilizer Demand**

Presented at the  
**Fertilizer Demand Working Party Meeting**

by  
**Dr. Michael R. Rahm**  
**Cargill Fertilizer**

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Sydney Australia



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**Thank you, Glen.**

**U.S. fertilizer demand has not received a lot of attention during recent years -- for some good reasons.**



Farm policy changes have reduced the volatility of U.S. fertilizer demand



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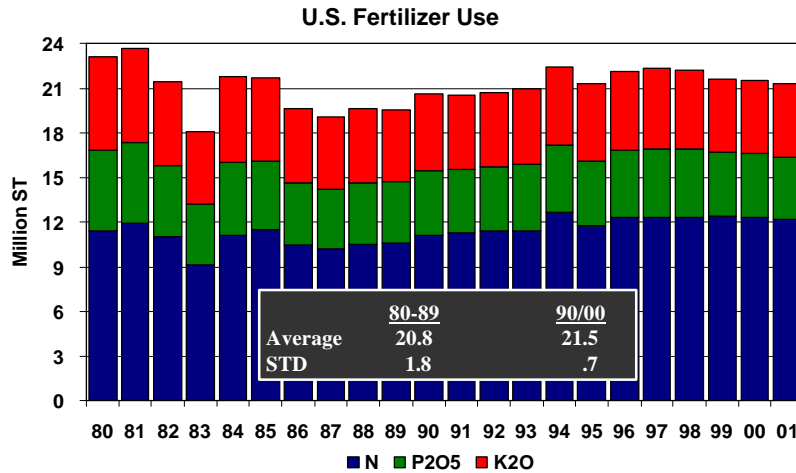
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**U.S. demand has remained *relatively* stable during the last 10 years as a result of changes in U.S. farm policy. The 1996 farm bill, in particular, eliminated land set-aside requirements and maintained minimum prices for the major field crops.**



Farm policy changes have reduced the volatility of U.S. fertilizer demand



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Those changes have reduced the volatility of U.S. fertilizer demand.

For example, U.S. nutrient use averaged 20.8 million short tons (mst) per year from 1980 to 1989. The standard deviation was 1.8 mst for this period. From 1990 to 2000, average annual use increased slightly to 21.5 mst, but the standard deviation dropped significantly to .7 mst per year.

U.S. fertilizer use fluctuated widely during the 1980s when farm programs idled significant acreage.

U.S. fertilizer demand has trended downward during this cycle, but the drop in use was far less than the large declines of the 1980s.



Other factors have impacted markets more than changes in U.S. demand



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**As a result, swings in U.S. demand have impacted world fertilizer markets much less than in the past, so it is not surprising that U.S. demand has not generated a lot of interest at sessions like these.**



**The United States remains a large and important fertilizer market**



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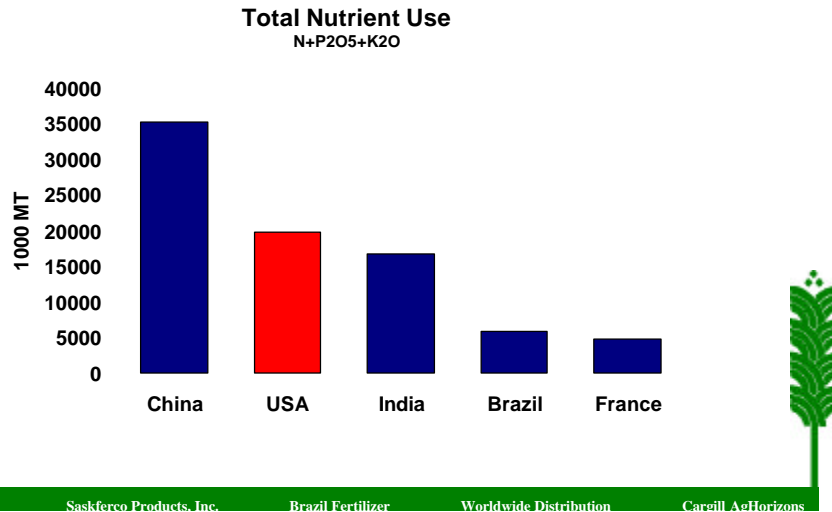
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**The United States, nevertheless, is a large and important fertilizer market.**



The United States still ranks second in total nutrient use



**The United States still ranks second behind China and just ahead of India in total nutrient use.**



**A reversal of U.S. agricultural policy could negatively impact fertilizer use**



**So, any reversal in the direction of U.S. agricultural policy that takes a step back in time and utilizes outdated supply-control programs and high price floors could negatively impact domestic nutrient use and world fertilizer markets.**



**Congress will debate new farm legislation during the next 12 months**



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**Such a reversal, at this point, appears unlikely. But the five-year farm bill passed in 1996 expires at the end of the 2001 crop year, and the U.S. Congress will debate and pass new farm legislation during the next 12 months or so.**



**Outline of Presentation**

**2001/02 U.S. Farm Legislation: Implications for Fertilizer Demand**

- ▶ U.S. Agricultural Policy - An Brief and Painless Historical Perspective
- ▶ The 1996 Farm Bill - A New Approach and Scorecard
- ▶ Likely Legislative Developments

**Other Factors Potentially Impacting U.S. Fertilizer Demand**

- ▶ U.S. Nutrient Balances
- ▶ Animal Waste Management



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**So, for the next 15 or 20 minutes, I will attempt to assess the impact of potential changes in U.S. agricultural policy on domestic fertilizer demand.**

**In order to assess where U.S. policy is headed, I think it is useful to put U.S. agricultural policy in historical perspective. So, the first part of this presentation will include a brief, and hopefully painless, review of the development of U.S. agricultural policy.**

**The second part of this analysis highlights the new direction in U.S. policy implemented by the 1996 farm bill and reviews the impact of this legislation during the last five years.**

**The last part of this analysis includes an assessment of the likely changes in U.S. farm legislation this year.**

**Finally, I will conclude the presentation by briefly examining two factors not related to farm policy that could impact U.S. fertilizer demand. Those include U.S. nutrient balances and animal waste management.**



**2001/02 U.S. Farm Legislation: Implications for Fertilizer Demand**



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**Let's begin by briefly reviewing the development of U.S. agricultural policy.**



**U.S. government has a long history of intervention in agricultural markets**



**The U.S. government has a long history of intervention in the agricultural sector, dating back to the 1860s.**

**The Homestead Act promoted the settlement of the frontier by giving citizens a quarter-section of land to farm. The Morrill Land Grant Act established the system of land grant universities that conducts agricultural research and disseminates information to farmers through an extension service.**



Farm programs were an integral part of New Deal policies



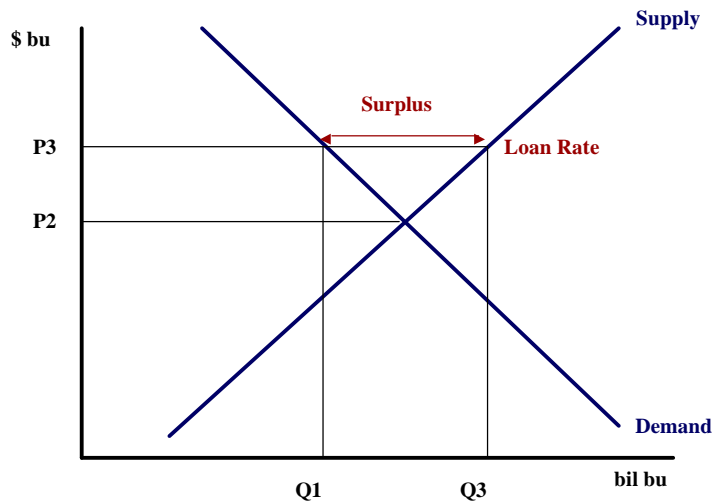
**But it was not until the Great Depression of the 1930s that the U.S. government began to tinker with the functioning of commodity markets.**

**Farm programs were an integral part of President Franklin Roosevelt's New Deal -- the blue print for economic recovery. The theory was that by "priming the pump" or stimulating the agricultural sector benefits would "trickle up" to the rest of the U.S. economy.**

**And that theory made some sense at the time. Approximately one-fourth of the U.S. population lived on farms and grain exports were inconsequential. Most rural counties depended on farming for their economic vitality. So programs to boost farm prices and incomes were viewed as a way to stimulate rural development and the U.S. economy.**



The basic price support mechanism dates back to Depression era programs



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U.S. farm programs have evolved over time, but the basic price and income support mechanism utilized in the first Depression-era programs survived for more than a half century. This chart illustrates how the mechanism worked.

Until implementation of the 1996 farm bill, U.S. programs, for all intents and purposes, established a minimum market price equal to what was called the loan rate (P3 on the chart).

If the market price dropped below the loan rate, the government, in effect, would buy and store grain. In other words, the government would take grain off the market in order to keep the market price from dropping below the loan rate.

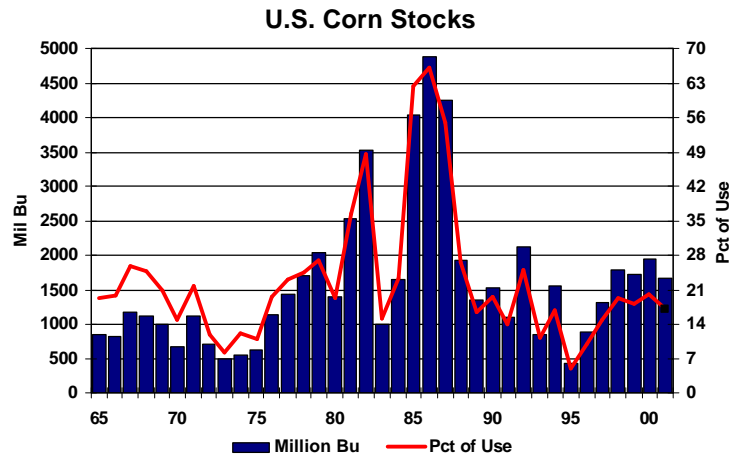
The program was optional. U.S. farmers had to sign up and often idle a percentage of their acreage in order to qualify for the program.

If the loan rate was set above the market-clearing price (P2 on the chart), the government would accumulate stocks (equal to the quantity Q3-Q1 on the chart).

Effective lobbying by agricultural special interests resulted in political pressure to keep loan rates at high levels. Rapid technical innovation and productivity increases resulted in economic pressure to push down real market prices over time.



High loan rates during the first half of the 1980s resulted in large government-owned grain stocks



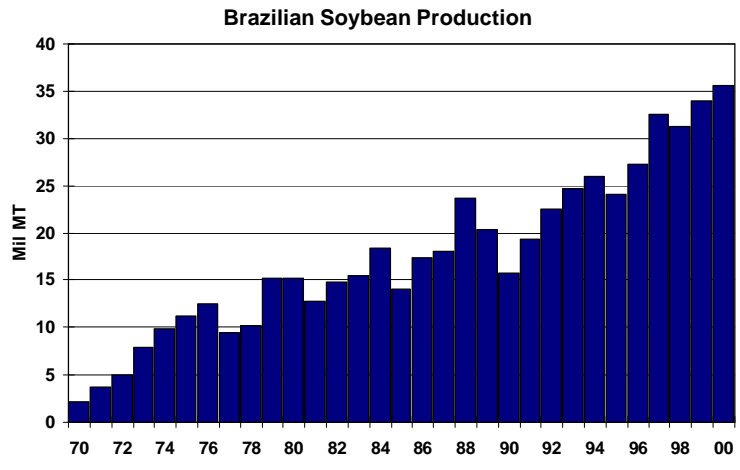
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So it is not surprising that the U.S. government eventually accumulated large grain stocks. This chart shows U.S. corn stocks since 1965.

Farm legislation in the early 1980s set loan rates at high levels. And productivity gains accelerated in the early 1980s following the period of relatively high grain prices in the 1970s. Those developments combined with good weather resulted in U.S. corn stocks of almost 5 billion bushels during the mid-1980s. The U.S. government owned most of these stocks.



High loan rates during the first half of the 1980s also stimulated production in other parts of the world

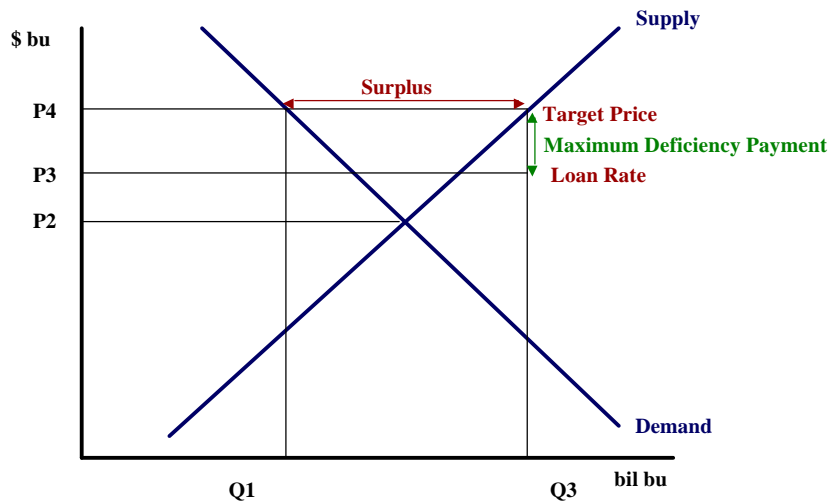


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High loan rates also provided a price floor for other producers worldwide, and helped to stimulate production in other parts of the world. This slide shows soybean production in Brazil.



Target prices and deficiency payments were added to programs in the 1970s



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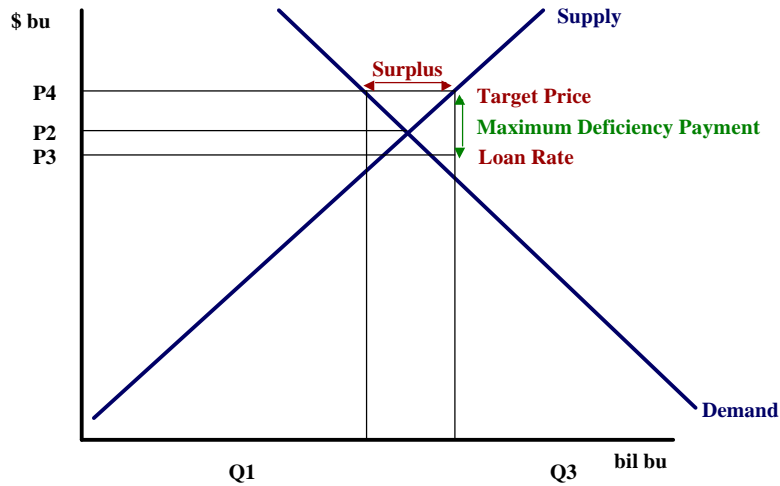
**In addition to the loan rate mechanism, 1970s legislation further complicated the programs by introducing a target price and deficiency payment as a new feature to boost farm income.**

**In return for idling a percent of base acreage, U.S. farmers, in effect, received the target price (P4 on the chart) for their grain and based planting and input decisions on this price.**

**If the market price (P2 on the chart) was at or below the loan rate, U.S. farmers would sell their grain to the government at the loan rate (P3 on the chart). In addition, farmers received a cash payment -- called the deficiency payment -- equal to the difference between the target price and the loan rate (P4 minus P3 on the chart).**



Target prices and deficiency payments were added to programs in the 1970s

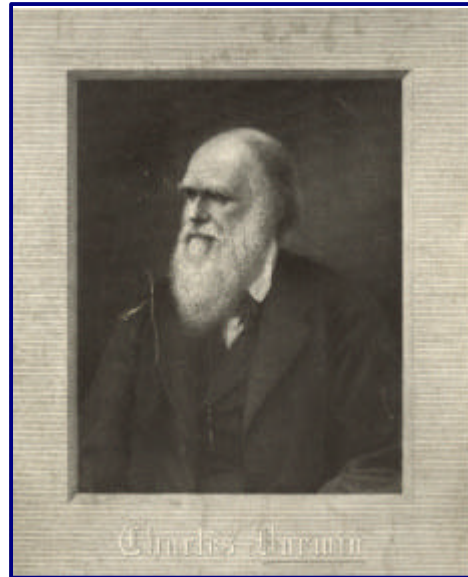


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If the market price (again P2 on the chart) was greater than the loan rate but less than the target price, farmers sold grain at the market price and received a deficiency payment equal to the difference between the target price and the market price (or P4-P2 on the chart).



**'It is not the strongest of the species that survive, nor the most intelligent; it is the one that is most adaptable to change.'**



**As you no doubt have concluded, U.S. farm policy -- developed by powerful, intelligent and well intentioned people -- had evolved by the mid-1990s into a complex set of programs that had failed to adapt to changes in the economic environment..**

**Programs distorted market signals and dictated to U.S. farmers how many acres of what crops to plant. Farm policy largely failed to recognize and adapt to rapid technical innovation in the agricultural sector and the integration of domestic and international agricultural markets.**

**As this quote by Charles Darwin indicates, farm policy had to adapt to changes in the economic environment in order to survive.**



**The Federal Agriculture Improvement and Reform Act of 1996**

**Eliminated land set aside requirements**

**Replaced the program of target prices and deficiency payments with fixed transfer payments that complied with WTO obligations**

**Retained loan rates but utilized loan deficiency payments (LDPs) as the main method of providing minimum prices to U.S. farmers**

**Continued the long term Conservation Reserve Program (CRP)**



**The 1996 farm bill -- officially titled the Federal Agriculture Improvement and Reform Act of 1996 -- significantly changed the direction of U.S. agricultural policy.**

**The legislation was dubbed the “Freedom to Farm” bill. It eliminated land set-aside requirements and base acreage. U.S. farmers were free to plant how much of whatever crop they wanted and that made the most economic sense.**

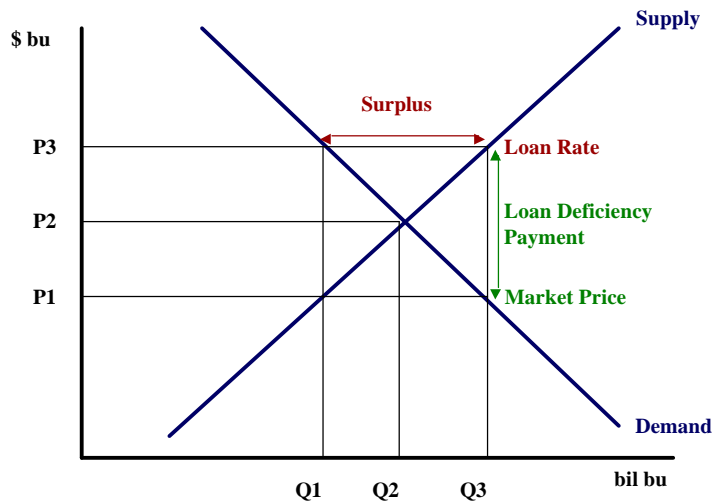
**The 1996 farm bill replaced the system of target prices and deficiency payments with fixed transfer payments that complied with World Trade Organization (WTO) obligations.**

**The legislation retained loan rates but relied on different method -- a system called loan deficiency payments -- to provide U.S. farmers with minimum prices. This method, in effect, guarantees U.S. farmers a minimum price, but allows the market price to fall to whatever level necessary to clear the market.**

**Finally, the 1996 farm bill continued the long term land conservation and idling program called the Conservation Reserve program established by the 1986 farm bill.**



The 1996 farm bill allows market prices to drop to low levels during periods of surplus



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**The change in the method of providing U.S. farmers a minimum price is worth examining in a little more detail. And I promise that this will be the last supply/demand graph that I we talk about in the presentation!**

As we have noted earlier, under previous farm bills, the loan rate established a market price floor (P3 on the chart). At this level, farmers produced a quantity Q3 and consumers used Q1. The U.S. government bought and stored most, if not all, of the surplus (equal to Q3-Q1 on the chart) in order to keep the market price at or near P3.

The 1996 farm bill still provides farmers a price floor called the loan rate, but the government no longer buys and stores large quantities of grain in order to prop up market prices

Instead, the government now allows the quantity produced (Q3 on the chart) to go on the market and lets the local cash price move to the level required to clear the market (P1 on the chart).

The government then pays farmers the difference (called the loan deficiency payment or LDP) between the loan rate (P3 on the chart) and the local market price (P1 on the chart). This provides U.S. farmers a price floor, gets the government out of the grain storage business and avoids propping up prices for other producers worldwide.



1996 Farm Bill Scorecard



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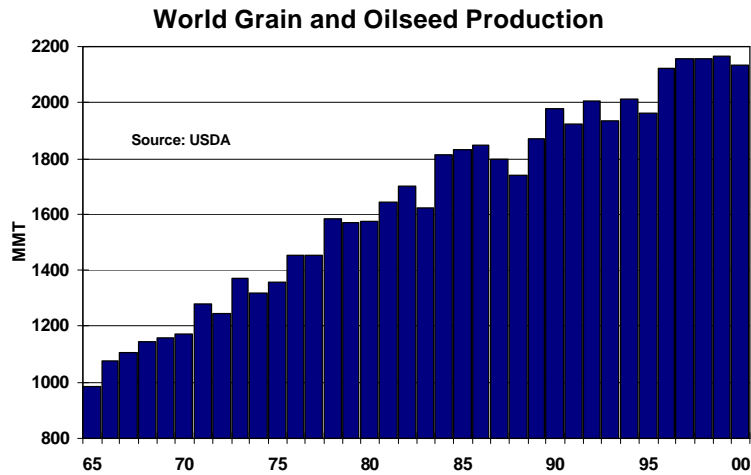
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**So, given the significant changes in the 1996 farm bill, how has the “Freedom to Farm” bill performed during the last five years? What does its scorecard look like?**

**There are critics of current U.S. farm policy to be sure. Some of their criticism is justified. And some of it is not. But the 1996 farm bill has moved U.S. agricultural policy in the right direction.**



Market Environment

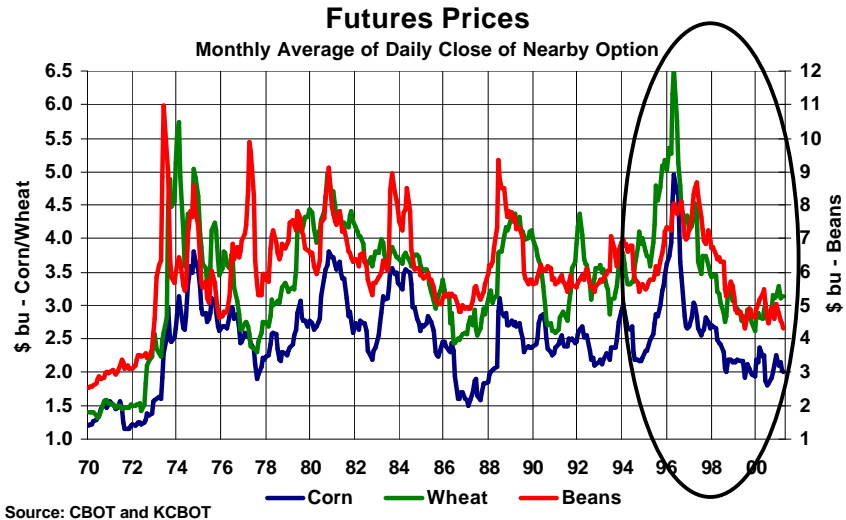


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**It is difficult to evaluate the 1996 farm bill without first describing the market environment in which it performed. The bill was crafted during a period of high farm prices and income. Some of the criticism of the bill is a consequence of the the environment in which the legislation was developed. As you can see from this chart, prior to 1996/97, farmers world-wide produced more than two billion metric tons (bmt) of grain and oilseeds only twice. You can also see that 2000/01 was the *fifth* year in a row that the world harvest topped not 2.0 bmt but 2.1 bmt. The step-up in world grain and oilseed production during this period resulted from both a significant jump in harvested area as well as five straight years of generally good or outstanding weather and yields worldwide.**



Market Environment

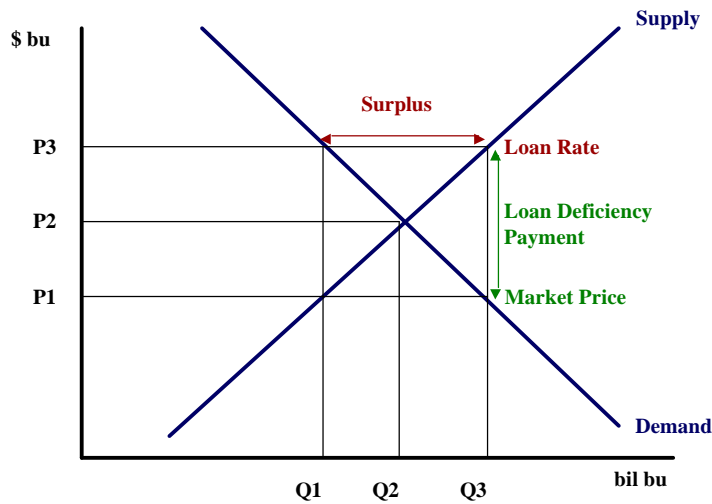


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**It is not surprising that prices for key grains and oilseeds plunged from record or near record highs in 1996 to record or near record lows during the past year or so.**



The 1996 farm bill allows market prices to drop to low levels during periods of surplus



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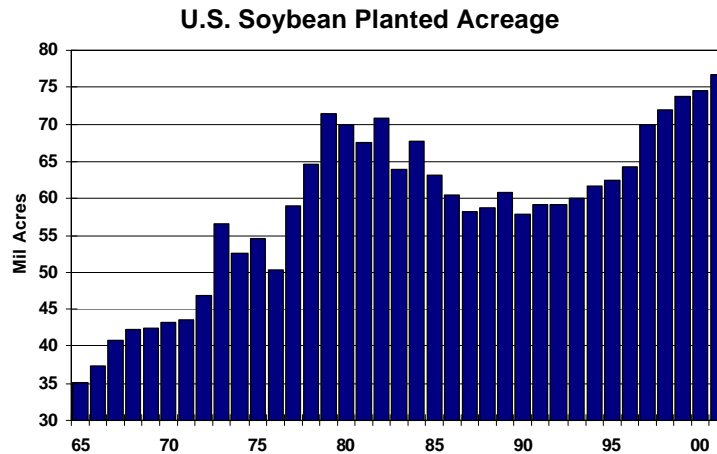
One of the unfair charges leveled by either unscrupulous or uninformed critics of the legislation is that the 1996 farm bill dramatically reduced the prices effectively received by U.S. farmers.

This chart shown earlier illustrates that the price actually received by farmers is the sum of the market price and the LDP payment. The loan rate in effect sets a minimum price received by farmers.

The bill, in fact, was designed to let the market price drop to whatever level was required to clear the market!



The soybean loan rate is high relative to the corn loan rate and that has boosted U.S. soybean acreage to record levels



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**One problem -- and valid criticism -- of the loan rate provisions of the 1996 farm bill is that the soybean loan rate is too high relative to the loan rate for corn.**

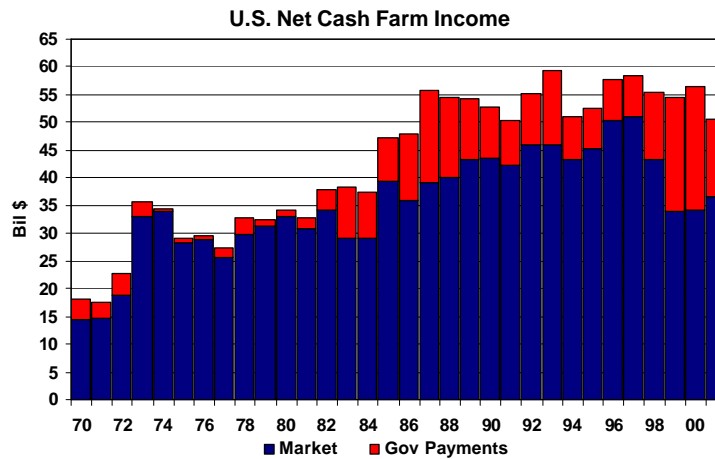
**For example, the national average soybean loan rate is \$5.26 per bushel versus the loan rate for corn of \$1.89 per bushel. A high soybean loan rate combined with new freedom to balance corn-soybean rotations caused U.S. soybean area to surge after 1996. In fact, U.S. farmers likely have planted as many if not more acres of soybeans as corn this spring.**

**Note that the \$5.26 soybean loan rate -- or the minimum price effectively received by U.S. farmers -- compares to the recent market price for new crop beans in the range of \$4.25 bu. That difference implies large per bushel and large dollar LDP payments to soybean producers this year.**

**Because LDP payments are commodity specific, they do not fall into the “green box” and thus count toward the aggregate measure of support (or AMS) as defined by the WTO agricultural agreement.**



Record government payments have kept U.S. net cash farm income at high levels during this downturn in agriculture



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The sharp drop in grain and oilseed prices has caused U.S. government payments to balloon during the last two years.

This chart shows U.S. net cash farm income in nominal dollars since 1970.. Record government payments largely have offset the impact of low commodity prices during the last two years. U.S. cash farm income totaled \$56.4 billion in 2000. Of that, 39% or \$22.1 billion is from government payments. The blue portion of the bar is income generated by the market. It is the difference between cash receipts and cash expenses. The red portion of the bar is income from government payments.

Four types of transfers make up government payments. The first is the fixed transfer called an agricultural market transition payment. These fixed payments replaced the old system of target prices and deficiency payments. Transition payments totaled \$4.8 billion in 2000.

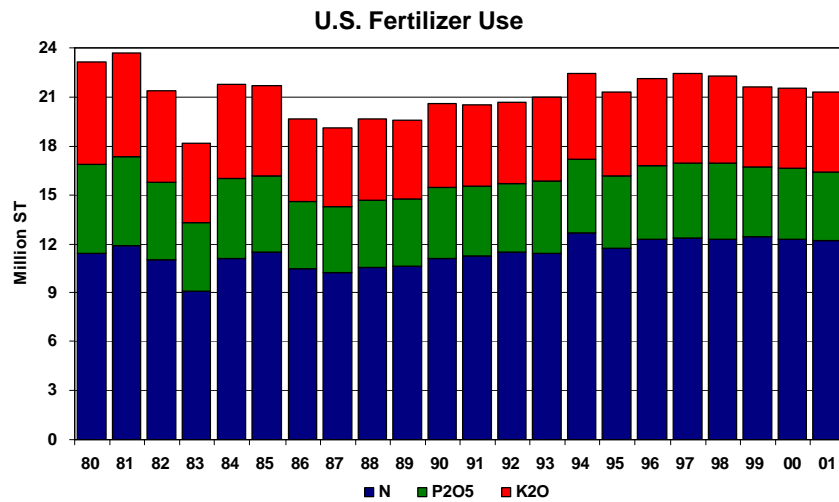
The second type of transfer payment is the loan deficiency payment or LDP. These totaled \$6.4 billion last year.

The third type of transfer payment is rental payments to conservation reserve program or CRP participants. These totaled \$2.0 billion in 2000.

The final type of transfer includes emergency and disaster relief payments. These totaled \$8.9 billion in 2000.



U.S. fertilizer use has remained relatively stable during the 1990s

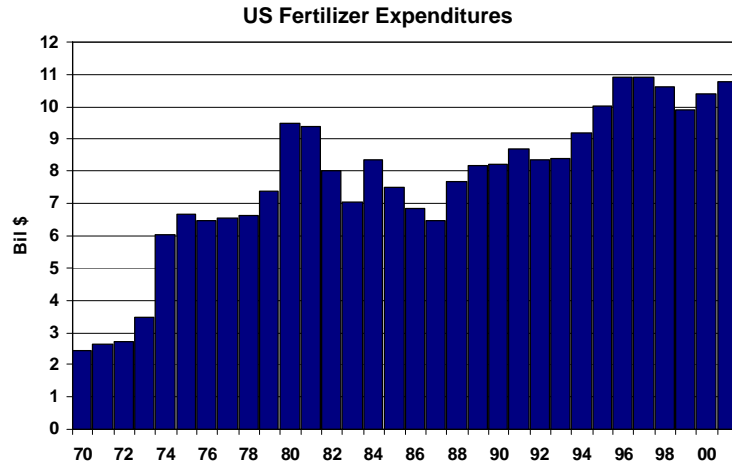


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Large government transfer payments have helped to keep U.S. fertilizer use



U.S. fertilizer expenditures also have remained relatively stable



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and U.S. fertilizer expenditures relatively stable during the current cyclical downturn.



Likely (hopeful) farm bill developments: fine tuning but no major overhaul



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**So, what will Congress do during the current farm bill debate?**

**I am not foolish enough to try to predict the outcome of this highly charged political event.**

**The take away on this slide gives the bottom line assessment. Congress likely will fine tune components of the 1996 farm bill rather than undertake a complete overhaul of U.S. farm policy.**



**Likely (hopeful) farm bill developments: fine tuning but no major overhaul**

**No return to land set aside requirements**



**So, what will happen?**

**First, it appears unlikely at this point that Congress would revert to large land set-asides. Some members of Congress still will advocate set-asides, but the most important lesson of past policies is that supply control simply does not work in the current economic environment. A reversion to any form of set aside would constitute a major policy setback.**



Likely (hopeful) farm bill developments: fine tuning but no major overhaul

No return to land set aside requirements

Continuation (and likely) increase in fixed transfer payments with the addition of a counter-cyclical component in order to minimize the reliance on “emergency” assistance



**Second, fixed transfer payments -- completely uncoupled from production -- will continue and likely increase in order to minimize the reliance on or need for “emergency” measures as well as to insure that U.S. farm programs comply with WTO obligations.**

**In fact, recent budget resolutions passed by the House and Senate include base level spending that facilitates an increase fixed transfer payments. There is the political will to transfer income from taxpayers to farmers in the United States.**

**In addition, Congress likely will add a counter cyclical component to the program. Critics of the 1996 farm bill complained that fixed transfer payments were too big during strong markets and too small during weak markets. A counter-cyclical component would provide supplemental payments to farmers when national revenue for a program crop or aggregate income from all program crops dropped below a percentage of the historical average. The concept is good in theory but building a workable program may prove difficult.**



**Likely (hopeful) farm bill developments: fine tuning but no major overhaul**

No return to land set aside requirements

Continuation (and likely) increase in fixed transfer payments with the addition of a counter-cyclical component in order to minimize the reliance on “emergency” assistance

**Readjustment in loan rates to reduce both market distortions and the risk of exceeding WTO aggregate measure of support (AMS) limits**



**Third, the current loan rate for soybeans is too high relative to corn. As noted earlier, this has caused a significant jump in U.S. soybean acreage. Congress hopefully will reduce this distortion and adjust loan rates to levels that reflect more closely the historical market value of individual crops.**

**Loan deficiency payments will remain high as long as market prices remain at low levels. If market prices do not rebound, the United States may have to adjust loan deficiency payments in order to comply with WTO obligations.**



**Likely (hopeful) farm bill developments: fine tuning but no major overhaul**

No return to land set aside requirements

Continuation (and likely) increase in fixed transfer payments with the addition of a counter-cyclical component in order to minimize the reliance on “emergency” assistance

Readjustment in loan rates to reduce both market distortions and the risk of exceeding WTO aggregate measure of support (AMS) limits

**Continuation of the Conservation Reserve Program (CRP) at or slightly greater than current limits with additional area targeted on the most environmentally fragile and beneficial lands**



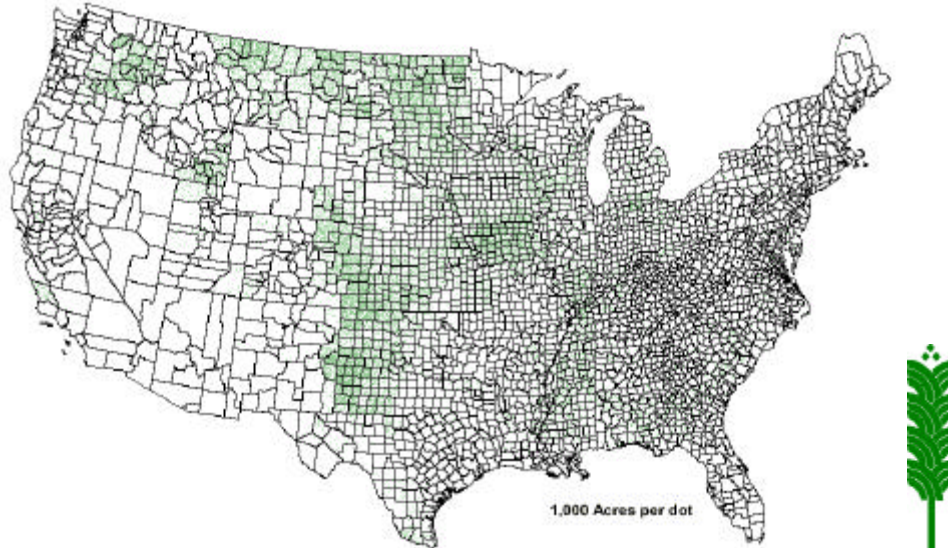
**Finally, Congress no doubt will continue the popular Conservation Reserve Program (CRP) with hopefully minor modifications.**

**The CRP, authorized by the Food Security Act of 1985 and extended by the 1990 and 1996 farm bills, is voluntary program that idles environmentally sensitive land for at least 10 years.**

**Farmers bid to enroll land into the CRP. Farmers receive annual rental payments for land enrolled into the CRP. In addition, the U.S. Department of Agriculture provides support for establishing a permanent land cover of grass or trees and technical assistance in planting the cover crop.**



CRP acreage as of October 1, 2000



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**CRP enrollment currently totals 31.4 million acres (or more than 13 million hectares). Maximum enrollment is 36.4 million acres. Annual rental payments total more than \$1.7 billion, but the USDA estimates that benefits of the program exceed \$3.1 billion per year.**

**The CRP helps to improve surface water quality, create wildlife habitat, preserve soil productivity, protect groundwater and reduce wind erosion damage. For example, the USDA estimates that average erosion rates on enrolled acres have dropped from 21 tons per acre to less than two tons per acre per year.**

**As you can see from this map, the bulk of the land enrolled in the CRP is in a band from Texas to North Dakota and Montana.**



**CRP likely will target the most environmentally fragile land**



**The program has proven so popular with sportsmen that a number of wildlife groups are lobbying to increase the enrollment limit by as much as another 10 million acres!**

**Most analysts, however, recommend keeping the CRP at its current enrollment limit and target additional enrollment to include buffer strips, filter strips, wetlands, grass waterways and partial field enrollments -- acres that when idled provide the most environmental benefit for the buck.**



**Likely (hopeful) farm bill developments: fine tuning but no major overhaul**

No return to land set aside requirements

Continuation (and likely) increase in fixed transfer payments with the addition of a counter-cyclical component in order to minimize the reliance on “emergency” assistance

Readjustment in loan rates to reduce both market distortions and the risk of exceeding WTO aggregate measure of support (AMS) limits

Continuation of the Conservation Reserve Program (CRP) at or slightly greater than current limits with additional area targeted on the most environmentally fragile and beneficial lands



**Hopefully when the dust finally settles after this debate Congress will have fine tuned the 1996 farm bill rather than under take a complete overhaul of U.S. agricultural policy.**

**If that happens, U.S. fertilizer demand likely will remain less volatile at or near current levels -- and not a featured topic at sessions like this.**



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- ▶ U.S. Nutrient Balances
- ▶ Animal Waste Management



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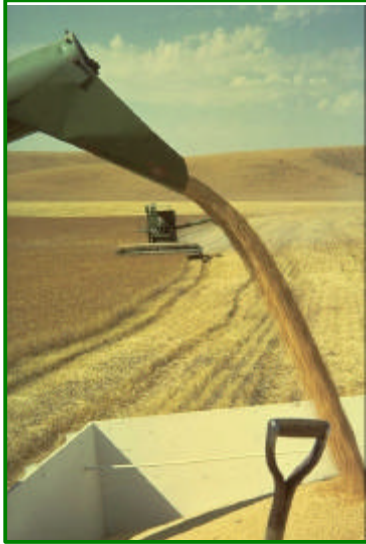
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**Let me conclude this presentation by making a couple of comments about two factors not related to farm policy but factors that could impact U.S. fertilizer demand in the near future.**



More nutrients have been removed by crops than applied by U.S. farmers



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**The first is U.S. nutrient balances.**

**Analysis by the Potash and Phosphate Institute (PPI) indicates that more nutrients have been removed from the soil by crops than have been applied to the soil by farmers in the United States during the past several years.**



U.S. Phosphate and Potash Balances 1999-2000

	P <sub>2</sub> O <sub>5</sub>		K <sub>2</sub> O	
	1990	2000	1990	2000
Million short tons				
Crop removal	4.9	5.6	7.8	9.1
Fertilizer applied	4.4	4.3	5.2	5.0
Balance	-0.5	-1.3	-2.6	-4.2
Applied % of removal	89	77	67	54

Nutrients in collectable manure in 1997: 1.6 and 1.8 million tons of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O respectively (NRCS, 2001). ERS estimates that 17% and 6% of the corn and soybean acreages were manured.



**For example, PPI analysis indicates that phosphate applied as fertilizer to crops during the last two years accounted for just 77% to 89% of the estimated phosphate removed by the crop. The gap for potash is even wider. This analysis indicates that potassium applied as fertilizer to crops during the last two years accounted for just only 54% to 67% of the estimated potassium removed by the crop.**



Illinois Phosphate Balance 1982-1996

Years	Removal		Inputs			Rem/
	Crop	Animal*	Fertilizer	Manure	Human	inputs
Short tons, thousands						%
82-86	517	8	466	112	16	88
87-91	498	8	385	106	16	100
92-96	574	8	381	101	16	117

\* Meat, eggs, milk.

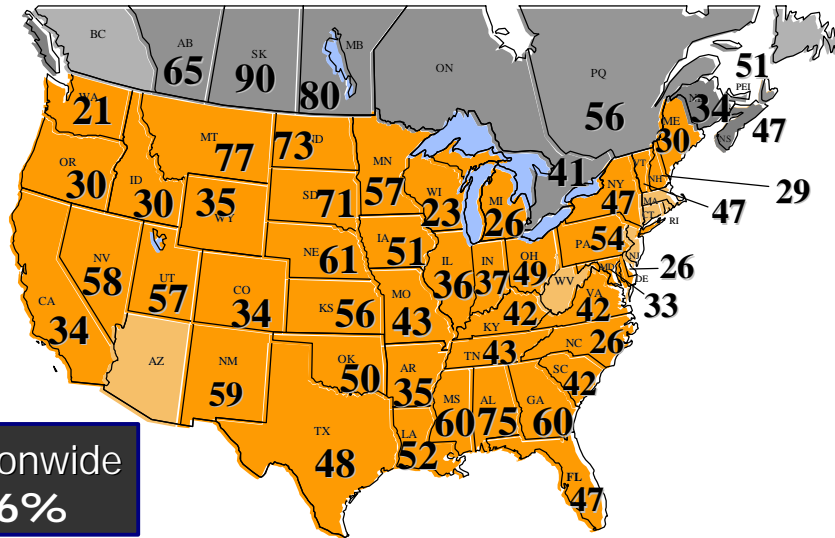
R. Hoeft, U. of Illinois



Longer term and more comprehensive studies such as this one from Illinois indicate that farmers built soil phosphate levels in the 1980s but have mined soils of phosphate during the 1990s.



Percent of soils testing medium to low in phosphate in 1997



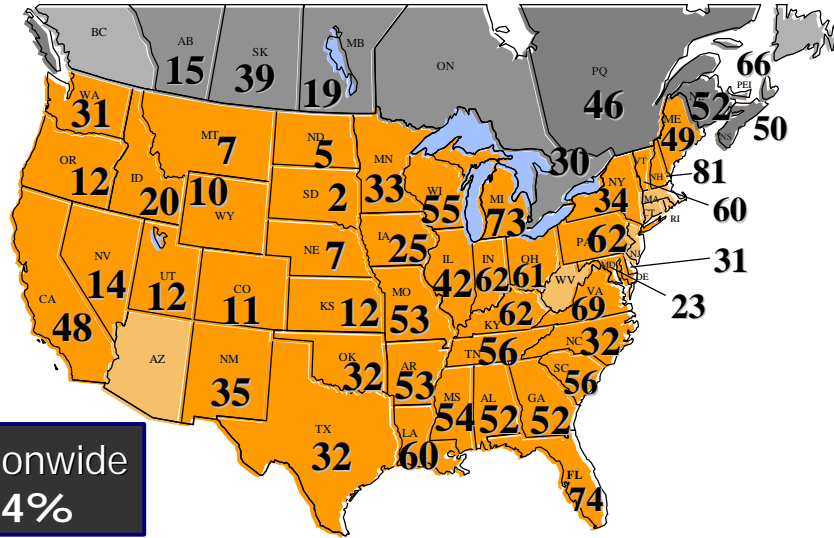
Nationwide  
46%

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As a result, the percent of U.S. soils testing medium to low in phosphate had increased to 46% in 1997.



Percent of soils testing medium to low in potassium in 1997



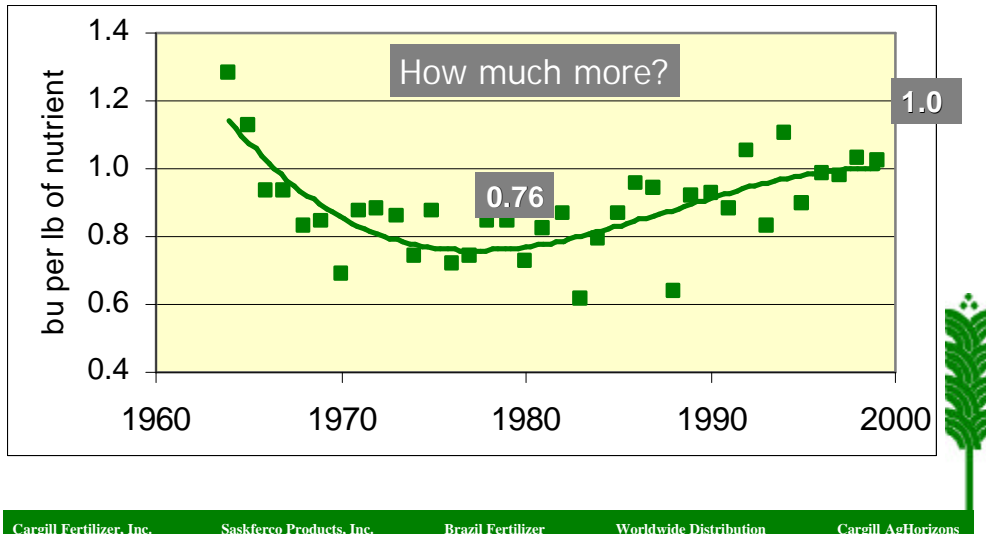
Nationwide  
44%

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And, the percent U.S. soils testing medium to low in potassium also had increased to 44% in 1997.



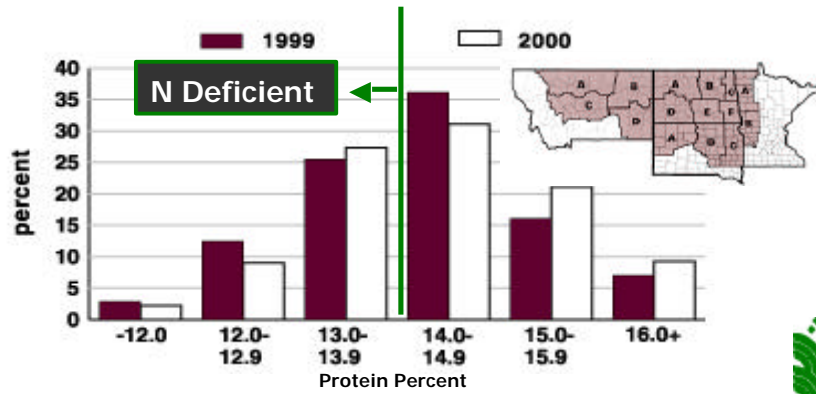
Nitrogen efficiency in U.S. corn production has increased 32% since 1980



**Even in the case of nitrogen, U.S. farmers have squeezed more bushels from a pound of nitrogen.**



Nearly 40% of U.S. hard red spring wheat is nitrogen deficient



*Grain protein levels below 14% are associated with yield loss from N deficiency for spring wheat (Goos, 1984).*

**If yields have not been impacted, crop quality has in some cases. For example, nearly 40% of U.S. hard red spring wheat was nitrogen deficient last year as indicated by protein levels.**



**More nutrients have been removed by crops than applied by U.S. farmers**



**So, the fact that more nutrients have been removed by crops than applied by farmers in the United States for the past several years suggests that U.S. demand may have some upside.**



Animal Waste Management



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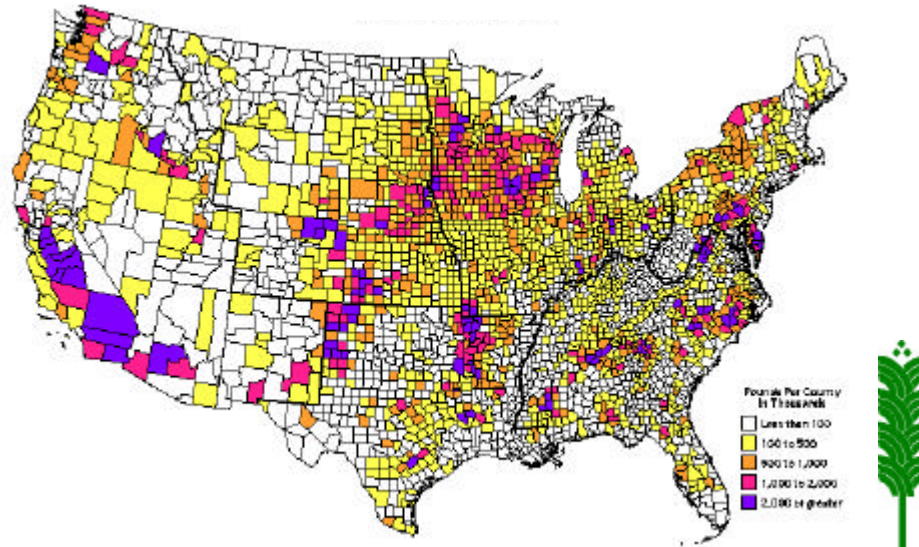
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**Finally, the growing supply and more stringent regulation of animal wastes have the potential to reduce commercial fertilizer demand in the United States.**



Estimated manure phosphorus production from confined livestock



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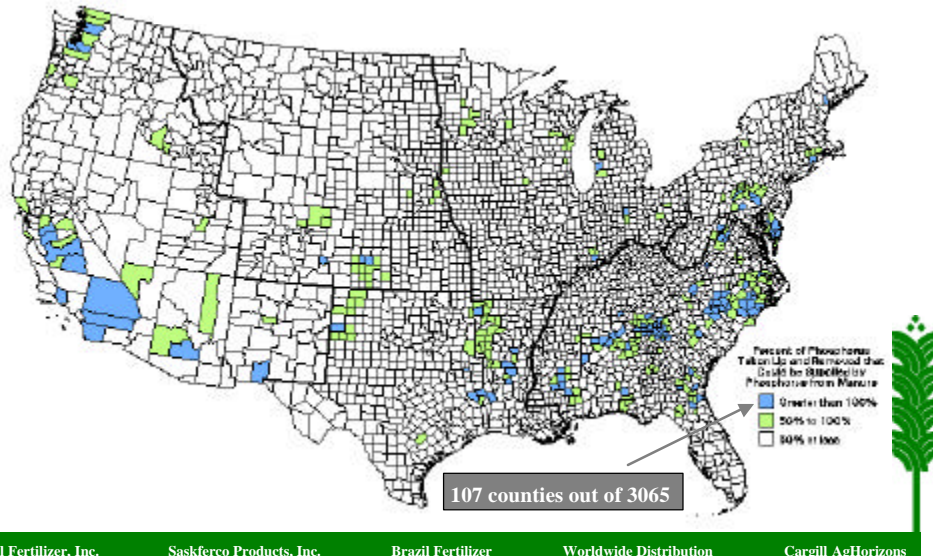
**The nutrient analysis of manure is low, but it adds up.**

**For example, the USDA estimated that manure from confined livestock operations in 1997 contained 1.6 million tons of phosphate and 1.8 million tons of potassium.**

**This maps shows where the animals and manure phosphate are concentrated.**



Potential for phosphorus available from animal manure to meet or exceed plant uptake and removal on harvested cropland, hay, and pasture



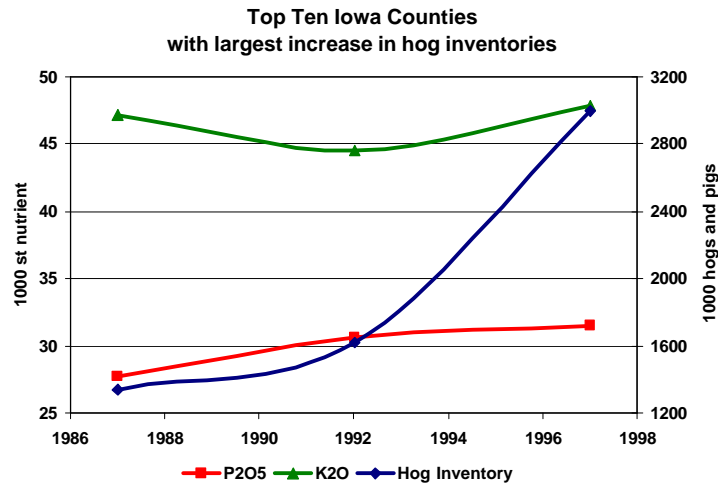
**This USDA map groups counties by the percent of phosphate use that could be met by manure. The counties shaded blue could meet 100% or more of their phosphate needs, the counties shaded light green could meet 50% to 100% of their needs, and the counties in white could meet less than 50% of their phosphate needs.**

**Those numbers raise flags about the potential impact of manure on fertilizer demand.**

**Although there are large supplies, the economics of manure use remain limited by the low analysis content. Until there is a cost effective way to concentrate nutrients in manure, the use of manure likely will stay viable in a small radius of production. In fact, USDA statistics show that manure is applied on only 17% of corn acreage and just 6% of soybean acreage.**



**Increases in hog production have not reduced P&K use**



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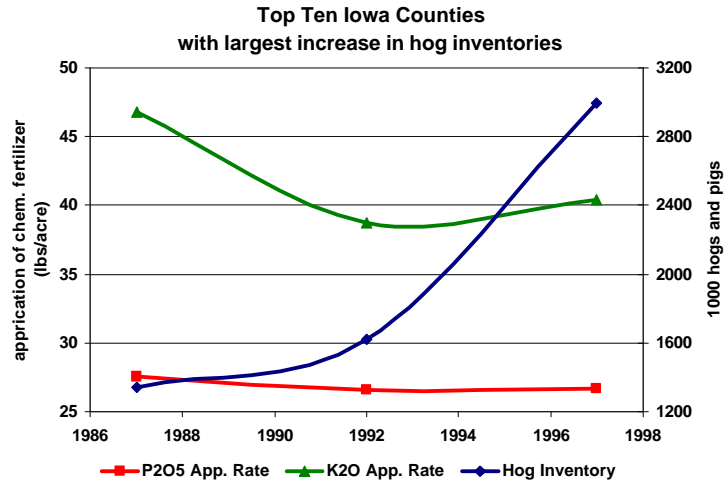
**The production of hogs in large confinement units has grown rapidly during the last 10 years -- especially in certain parts of Iowa.**

**Given the potential of larger manure supplies to reduce fertilizer demand, we examined phosphate and potash use in the 10 Iowa counties registering the largest growth in hog production between the 1992 and 1997 Census of Agriculture.**

**The blue line on the chart shows hog inventories and the red and green lines show phosphate and potash use, respectively, in these 10 counties. You can see that both phosphate and potash use has remained unchanged.**



**Increases in hog production have not reduced P&K application rates**



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**That also holds true for application rates.**

**Thus, the surge in hog and manure production in this area has not yet impacted P&K use.**



**MANURE HAPPENS: MANAGE IT**



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**MANURE HAPPENS: MANAGE IT**

**That is a bumper sticker hanging in the office of a colleague who works on a manure management project with Smithfield Foods-Murphy Farms.**

**The economics of concentrating and transporting animal waste long distances remains challenging. But there are significant and growing quantities of nutrients in animal wastes. As long as the nutrients are there, animal wastes have the potential to cut into commercial fertilizer demand.**



## Agricultural Policies Affecting U.S. Fertilizer Demand

Presented at the  
Fertilizer Demand Working Party Meeting

by  
Dr. Michael R. Rahm  
Cargill Fertilizer

May 21, 2001  
69th IFA Annual Conference  
Sydney Australia



**Thank you for your kind attention.**