FEDERAL AGRICULTURAL POLICY

A HARVEST OF ENVIRONMENTAL ABUSE

Jonathan Tolman

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EXECUTIVE SUMMARY

In the current debate over the re-authorization of the Clean Water Act, environmentalists, in their zeal to condemn big business as the source of America's "dirty" water, have overlooked a simple fact. Agricultural runoff is now the number one source of pollution in the nations rivers, streams, and lakes. As many other sources of pollution have been controlled agriculture has emerged as the largest source of water pollution in the nation.

Although the last decade has seen an increased awareness of the environmental effects of U.S. agriculture, the fundamental premises of U.S. agricultural policy have remained intact since the Great Depression. These farm programs were designed in an era before commercial pesticides, fertilizers and modern farming techniques. In many instances they have had and continue to have detrimental effects on the environment.

The U.S. sugar program is responsible for not only increased sugar production in south Florida but also more intensive sugar cane production, contributing to the increased phosphorus contamination of the Everglades which is disrupting the unique nature of the ecosystem. The elimination of the U.S. sugar program would likely have a significant beneficial effect on the Everglades ecosystem.

Even the field crop programs can have detrimental environmental effects. Wheat, corn and field grain programs contribute to the intensive use of land. An analysis of data from six major farm states shows that a fifty percent reduction in subsidies would decrease per acre chemical use by an estimated 17 percent and fertilizer use by and estimated 14 percent. The complete elimination of subsidies could result in a 35 percent reduction in chemical use per acre and a 29 percent reduction in fertilizer use per acre.

Another example of government induced environmental damage is the USDA peanut program. By requiring peanuts to be grown in only a handful of counties in the entire country, USDA indirectly increases the use of pesticides on peanuts.

Overall, consumers, taxpayers and the environment would be better off under a free market agricultural policy. Direct and indirect payments to farmers should be eliminated and all supply control programs should be ended.

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INTRODUCTION

For the last decade, taxpayers have footed the bill for farm programs to the tune of $10 billion a year. Despite such tremendous expenditures, the American public has reaped little benefit from this show of federal largess. Farm subsidies are no longer needed to ensure food security. They are no longer needed to support farm income. And they are no longer needed to stabilize agricultural markets. Their sole purpose is to placate special interests.

Not only do these farm programs provide little benefit, they also carry considerable costs. Current farm policy, through supply control programs, raises the price of many farm products. These same supply control programs encourage the more intensive use of agricultural land resulting in environmental stress. According to the U.S. Environmental Protection Agency, agricultural runoff is the number one source of pollution in the nation's rivers, streams, and lakes.[1]

Current farm policy, through supply control programs, raises the price of many farm products.

An analysis of data from six major farm states shows that a fifty percent reduction in subsidies would decrease chemical use by an estimated 17 percent and fertilizer use by and estimated 14 percent. The complete elimination of subsidies could result in a 35 percent reduction in chemical use per acre and a 29 percent reduction in fertilizer use per acre.

In addition to commodity programs, other agricultural policies are often responsible for local or regional environmental abuse. It is clear, for example, that the U.S. sugar program is responsible for not only increased sugar production in south Florida but also more intensive sugar cane production, contributing to the increased phosphorus contamination of the Everglades, thus changing the unique nature of the ecosystem. The elimination of the U.S. sugar program would likely have a significant beneficial effect on the environment of the Everglades ecosystem.

Both the environment and the consumer would be better off under a free market agricultural policy.

Another example of increased chemical use is the USDA peanut program. Under the peanut program the USDA licenses all peanut farmers and assigns each a yearly quota. One of the conditions of the peanut program is that farmers are required to grow peanuts on the same farm. This leads to a situation where peanuts are grown year after year in the same handful of counties and nowhere else. In some regions this means that extensive quantities of pesticides are used. For example, peanuts grown in Georgia use four times more pesticide per acre than those grown in Texas. Obviously, from an environmental perspective it would be better to grow peanuts where chemical inputs could be minimized. The current peanut program, however, prohibits this.

Overall, both the environment and the consumer would be better off under a free market agricultural policy.

BACKGROUND

Environmental analysts have often noted that government policies which encourage more agricultural production from less land can directly conflict with goals for environmental protection. This has been observed by both traditional and free market environmental thinkers.

In their book *Free Market Environmentalism*, Terry Anderson and Donald Leal note:

> The negative impact on the environment has been exacerbated by programs that support commodity prices and reduce risks by subsidizing insurance. With returns higher and costs lower than they would be in a free market, farmers plant more acres and produce more crops. To reduce the surpluses, federal programs require farmers to cut back on the acreage planted, but farmers attempt to circumvent such efforts by using more pesticides and fertilizers to increase output per acre.[2]

Farmers all across the country are increasing the supply of certain crops beyond what would be produced in a consumer driven market.

Other researchers have come to similar conclusions using econometric and mathematical models which show that government programs increase the use of pesticides and fertilizers.[3] A study conducted on North Carolina coastal plain agriculture, for example, determined that the elimination of farm programs would have reduced nitrogen leaching due to fertilizer use by 46 percent.[4] Statistical analysis of chemical and fertilizer use has also indicated that farm programs contribute to more intensive use of chemicals and fertilizers. Data from the 1991 and 1992 Cropping Practices Surveys showed that corn producers who participated in the USDA feedgrain program used nitrogen, herbicides and insecticides at greater rates than those who did not participate.[5]

FARM PROGRAMS

The Department of Agriculture subsidizes farmers for growing most field crops, such as corn, wheat, barley, oats, sorghum, cotton and rice. They offer the

farmer a guaranteed price per bushel of commodity. Consequently, the farmer has an incentive to maximize his production.[6]

Between 1991 and 1994, the USDA actually spent $11.6 billion more than Congress had anticipated in the 1990 farm bill.

Most direct subsidies to farmers take the form of deficiency payments. When a farmer goes to sell his product on the market, if the market price is higher than the guaranteed price the government pays the farmer nothing. But if the guaranteed price is higher, the government pays the difference between the market price and the guaranteed price.

In the long run, the government ends up paying huge sums of money, approximately $10 billion a year, directly to farmers. This occurs because of two compounding factors. The guaranteed price is invariably above the market price. For example, in 1992 the target support price for corn was set at $2.75 per bushel. The average U.S. market price that year was $2.05 per bushel. Wheat subsidies are similarly elevated. The target price for wheat in 1992 was $4.00 a bushel, the market price was $3.25 per bushel. Unless there is a severe shortage of a particular commodity, the market price will likely stay significantly below the guaranteed price. Because the guaranteed price is set higher than the market price, the farmer has an economic incentive to produce more. Consequently, farmers all across the country are increasing the supply of certain crops beyond what would be produced in a consumer driven market. But increases in supply drive down the market price, and when the market price goes down the government has to make higher deficiency payments. Not surprisingly, USDA commodity programs routinely spend more than their budgeted allocations. For example, predicted budgetary expenditures in the 1990 farm bill for direct payments were on average 75 percent of actual expenditures. In other words, between 1991 and 1994, the USDA actually spent $11.6 billion more than Congress had anticipated in the 1990 farm bill.[7] (See chart below.)

Farm Spending
(billion of dollars)

Year	Predicted Spending	Actual Spending
1991	7.1	10.1
1992	8.5	9.7

Source: Jonathan Rauch, "Plowing a New Field," National Journal 1/28/95.

In order to keep its budget under control, the USDA has historically engaged in policies to drive up the market price of subsidized commodities. Typically this is accomplished by requiring farmers who participate in the subsidy program to set aside a certain portion of their farmland and grow

nothing on it as a condition of receiving the subsidy. In 1992, for example, the acreage set aside was 5 percent for corn, sorghum, barley and wheat.[8] In other words, to participate in the corn commodity program a farmer would have had to set aside 5 percent of the acreage he would normally plant with corn and grow nothing on it.

The Everglades of South Florida provide a striking case study for the potential effects of government policies and chemical use on the environment.

Equally important, the USDA also encourages farmers to participate in voluntary set aside programs where they are paid to keep part of their land idle. The Conservation Reserve Program (CRP) is the best example of such a program. Under the CRP, the USDA pays annual rent to farmers who agree to idle their land for ten years.[9] Currently the USDA has enrolled 36.4 million acres of land into the CRP, an area larger than the entire state of Iowa.[10] In effect CRP is a supply control mechanism, restricting the amount of land which is in production.[11]

Farmers participating in the subsidy programs are given tremendous economic incentives to maximize their yields but they have fewer acres with which to work. Consequently, many of those farmers increase their non-land inputs, typically by increasing chemical and fertilizer use.

CASE STUDY: SUGAR SUBSIDIES AND THE EVERGLADES

The Everglades of South Florida provide a striking case study for the potential effects of government policies and chemical use on the environment.

The federal government has set up several different price schemes in an effort to promote domestic sugar production.

In 1948, Congress authorized the Army Corps of Engineers to construct 1,500 miles of canals and levees throughout the area of southern Florida.[12] This was done in an attempt to control flooding in the region and promote the farming of sugarcane in the Everglades, a locality whose soil was uniquely suited to this crop. The Corps completed its task several years later. Over 700,000 acres of land was turned into the Everglades Agricultural Area (EAA).[13] Through a series of pumps, canals, and levees, the Corps now diverts over 2.5 million acre-feet of water every year into the Atlantic Ocean and Gulf of Mexico.[14]

The drainage project itself has caused several severe environmental problems, including a shrinking water base for wildlife in the region. In the twenty year period from 1953 to 1973, when much of the Corps draining program was in operation, the state of Florida lost 1.44 million acres of wetlands, almost entirely in the Everglades region.[15] Furthermore, the state has lost over fifty percent of the Everglades' original area to drainage and pollution in the past two hundred years, with much of that loss occurring over the last fifty years.[16] While there have been some legitimate concerns about flooding in the area, this drainage would, for the most part, be unnecessary if the land was not used for agriculture.

In addition to the environmental damage caused by the drainage, agricultural policies encouraging intensive sugar production have exacerbated the environmental degradation.

The federal government has set up several different price schemes in an effort to promote domestic sugar production. These supports take the form of Commodity Credit Corporation (CCC) non-recourse loans as well as import restrictions on foreign produced sugar. While each one seems to operate with a different goal, their overall, cumulative effect is to support the price of sugar in the U.S. and allow the increased marginal production of this crop.

The USDA has established a tariff-based quota on imported sugar.

The CCC non-recourse loans are an elaborate way for the government to guarantee a minimum price for sugar. Loans are made to the processors of sugarcane who purchase the crop at a guaranteed price. The processors can store the final product for up to nine months, the time limit of the loan, to see whether the price of sugar exceeds the USDA's established minimum price. If it does not, the processors may simply default on their loan and give their harvest to the USDA which accepts it as payment-in-full. The dollar "floor" price for raw sugar cane is 18 cents per pound, nearly twice the going rate for sugar in the world market-place.[17]

Because the floor price is set so high, if there were no trade barriers for sugar, domestic buyers would buy their sugar for the world price and sugar producers would simply default on their loans and take the guaranteed price of 18 cents per pound. This would leave the government holding millions of tons of overpriced sugar. To prevent this from happening, the USDA has established a tariff-based quota on imported sugar. Under this quota system, foreign countries pay a low level tariff for sugar up until the point they reach the quota set by the USDA. Once they reach this point, any additional sugar they export to the U.S. is subject to a 16 cent per pound tariff.[18] This high duty, which is evaluated every year, allows the USDA to control the amount of refined sugar coming into the country and maintains high domestic sugar prices.

Overall, the sugar program is estimated to cost consumers $1.4 billion a year.

These higher prices are then passed on to the consumers. Overall, the sugar program is estimated to cost consumers $1.4 billion a year. The higher prices benefit both producers and processors. For example, in 1992, farmers of sugarcane received $161.5 million in benefits because of the commodity program, and processors received $107.7 million.[19]

What the government fails to take into account, however, is the environmental impact of their actions. As already noted, the USDA's price supports provide an incentive for farmers to produce more of their crop than they would if no such subsidies existed. To take advantage of this incentive, growers are forced into overusing non-land inputs such as fertilizers, chemicals which cause extensive harm to the Everglades ecosystem.

A major component of fertilizer is phosphorus, a chemical not abundantly found in the natural water supply of the Everglades. Due to the extensive use of fertilizers in farming, a great deal of phosphorus leaches into the groundwater, which is then pumped out to the Everglades National Park and Loxahatchee Wildlife Refuge. A recent study found that up to 80 percent of phosphorus used in fertilizing sugarcane crops is transferred with drainage water into the Everglades.[20] Once there, the phosphorus allows many non-native plants to outgrow and crowd out naturally occurring species. A prime example of this phenomenon is the vast replacement of native sawgrass with non-native cattails in nutrient rich waters.

Unfortunately, the consequences of overproduction are not only related to compositional changes in plant life, but extend higher up the food chain. The plants that are appearing as a result of this pattern change cannot support many kinds of animal life. Without a ready supply of food, many animals once common to the Everglades are shrinking in number. This is not just affecting certain classes of animals, but the entire food chain. Bird populations have been reduced dramatically due to the striking drop in habitat as well as fish and other aquatic species on which they feed. One study suggests that the present number of birds in the Everglades National Park area is only 10 percent of what it used to be at the turn of the century.

The elimination of the U.S. sugar program would likely have a significant beneficial effect on the environment of the Everglades.

Changes in the U.S. sugar policy have accelerated the domestic production of sugarcane in recent years. Sugar consumption in the U.S. was 9 million tons in 1981, a level which has seen no overall growth in the past thirteen years. Sugarcane production in the U.S., however, has increased approximately 26 percent from 1981 to 1991, from 2.7 million tons to 3.4 million tons.[21] This is due to the increasingly strict tariff barriers set up by the USDA in an effort to maintain the domestic price of sugar. In 1977, the U.S. imported 6.1 million tons of sugar. By 1993 that amount had dropped 77 percent to only 1.35 million tons.[22]

This increase in production has been accompanied by both increases in land use and the application of non-land inputs such as fertilizer. In Florida, for example, the acreage that was farmed and harvested for sugar went from 233,000 acres in the early 1970s to 346,000 in the early 1980s to a high mark of 420,000 acres in 1990.[23] Phosphorus concentrations in agricultural runoff water pumped into Lake Okeechobee from the Everglades Agricultural Area (EAA) also increased during this time, from a level of 0.095 to 0.314 milligrams per liter (mg/l) between the years 1973 to 1979 to a level of 0.188 to 0.573 mg/l for the years for 1983 to 1985.[24]

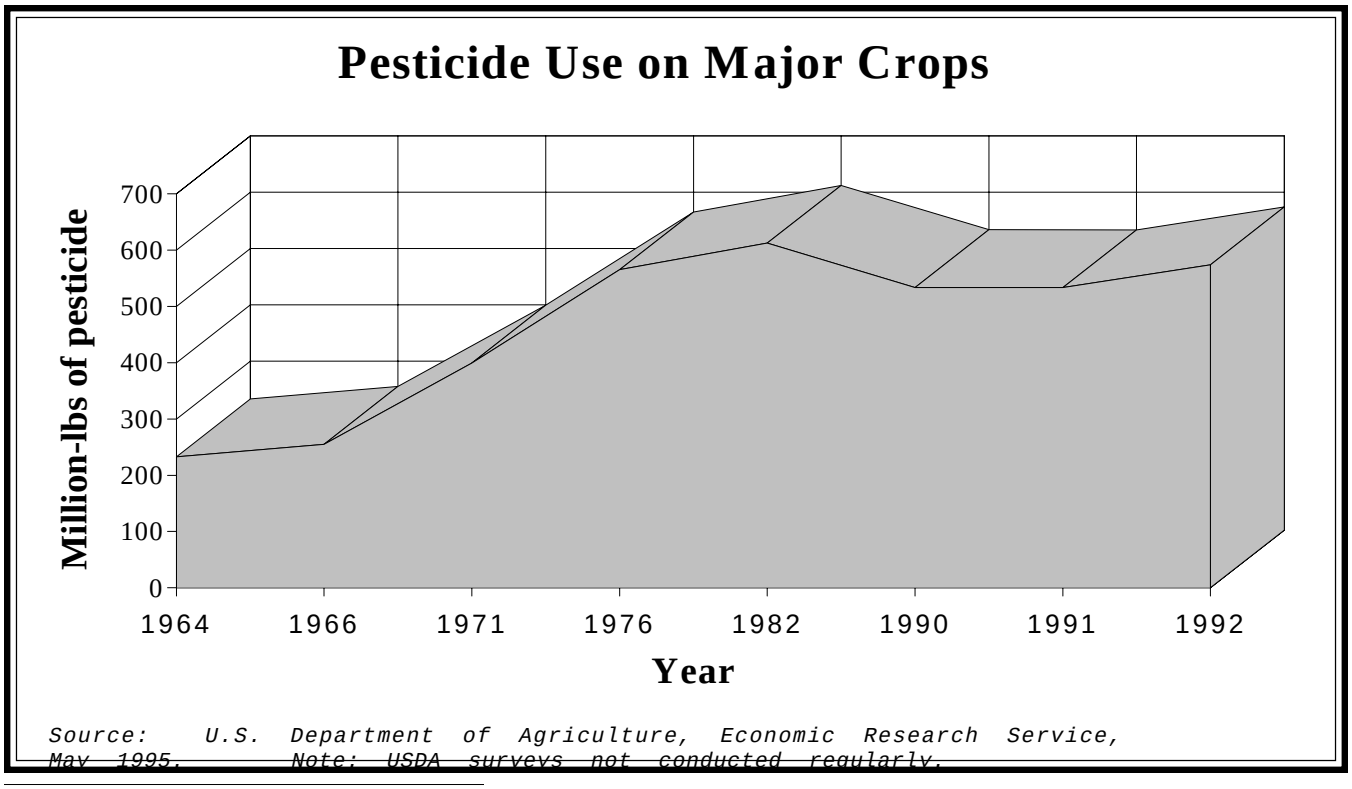
It is clear that the U.S. sugar program is responsible for not only increased sugar production in south Florida, but also more intensive sugar cane production and its attendant environmental impacts. The elimination of the U.S. sugar program would likely have a significant beneficial effect on the environment of the Everglades.

OTHER FARM PROGRAMS

Various other programs aimed at supporting the farm sector can also have secondary environmental effects. For example, market orders are used by the USDA to control many fruit and vegetable crops.[25] Under market orders the USDA does not restrict acreage, instead it applies an often strict standard on the appearance or "quality" of the product. By restricting the amount of produce which can qualify as grade "A" the USDA restricts the amount which can be marketed. Consequently, market orders often provide incentives to produce the highest "quality" produce in order to receive the highest grade and therefore the highest price. If grades are determined on the basis of cosmetic standards and cosmetic quality can only be achieved through high chemical use rates, the production of that commodity will likely involve greater use of chemicals.[26]

Peanuts are grown year after year in the same handful of counties and nowhere else.

Another example of increased chemical use occurs in the peanut program. Under this program the USDA licenses all peanut farmers and assigns each a yearly quota. A farmer cannot sell more than his yearly quota in the domestic market. One of the conditions of the peanut program is that farmers are required to grow peanuts on the same farm two out of three years,



Source: U.S. Department of Agriculture, Economic Research Service, May 1995. Note: USDA surveys not conducted regularly.

A county by county analysis of six states showed a significant correlation between subsidies and chemical use as well as between subsidies and fertilizer use.

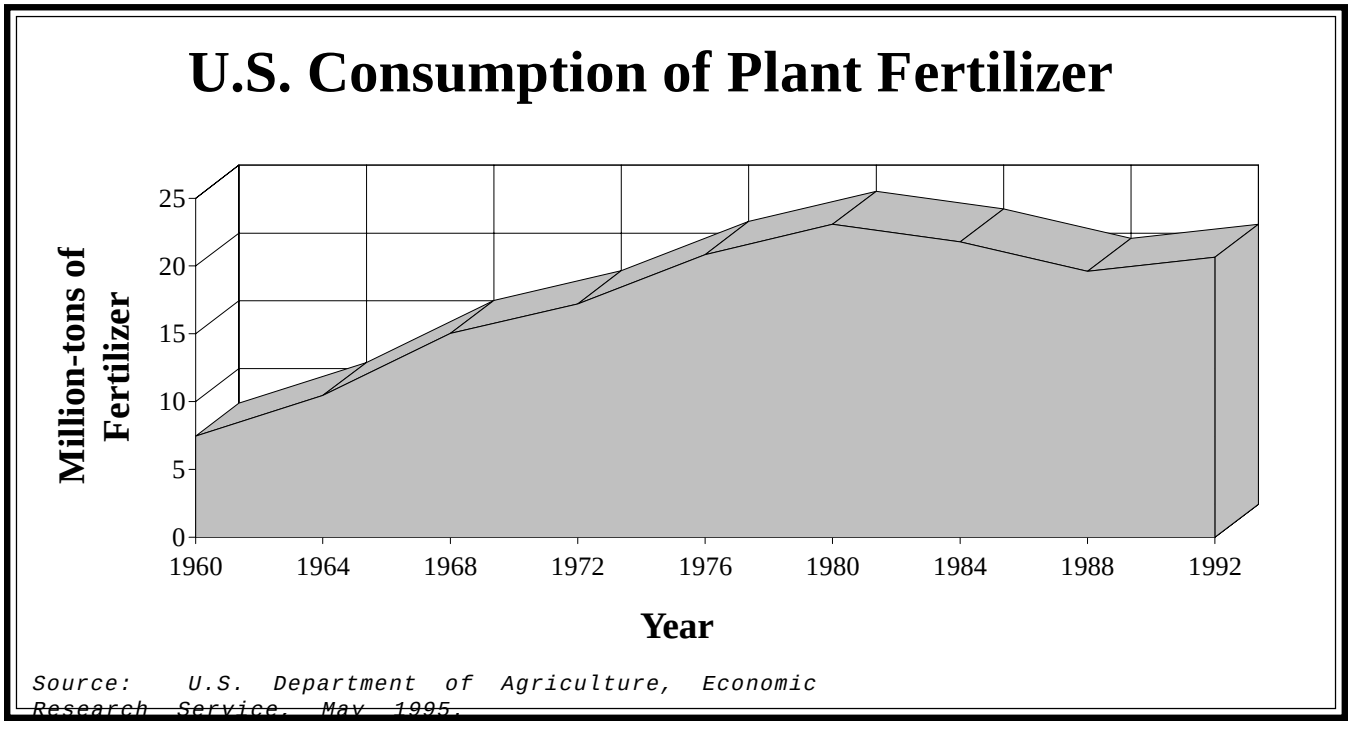
and the quota must always be grown in the same county.[27] This leads to a situation where peanuts are grown year after year in the same handful of counties and nowhere else. In some regions this means that extensive quantities of pesticides are used. For example, peanuts grown in Georgia use 13 pounds of pesticide per acre, while those grown in Texas require only 3 pounds per acre.[28] From an environmental, and perhaps from an economic perspective, it would be better to be able to grow peanuts where chemical inputs could be minimized. The current peanut program, however, prohibits this.

CURRENT FERTILIZER AND PESTICIDE USE

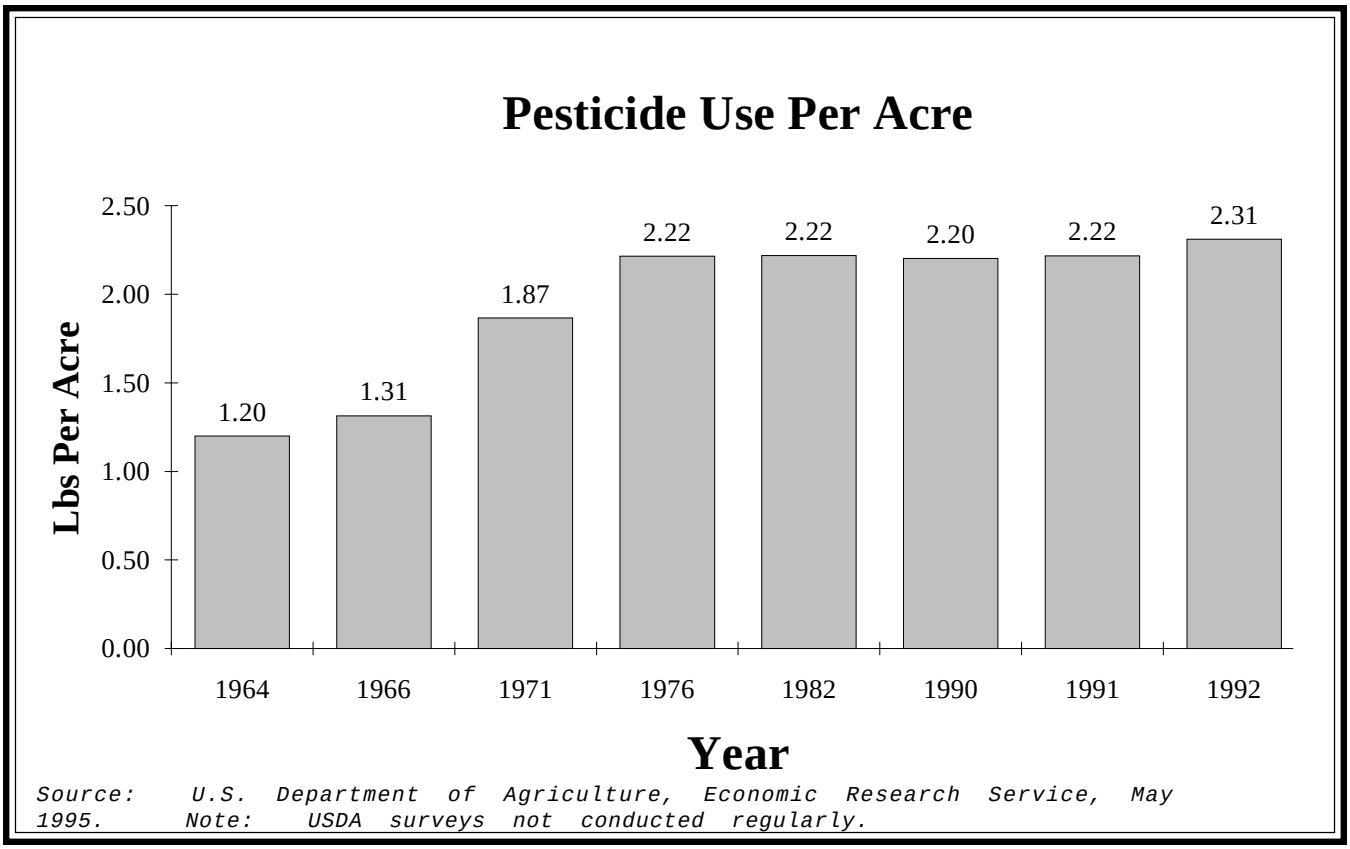
Beginning in the early 1960s, the USDA began surveying the use of fertilizers and pesticides in the United States. Since that time pesticide use has more than doubled and commercial fertilizer use has tripled. These increases resulted from increased acreage but more importantly from higher application rates and increased proportion of acres treated with chemicals (see charts).

Total chemical and fertilizer use peaked in the late 1970s and early 1980s. Since then per acre application rates have remained roughly constant at about 2.2 pounds of pesticide per acre and 130 pounds of fertilizer per acre. Removing current agricultural programs would likely result in a decline of this use.

COMMODITY PROGRAMS AND CHEMICAL USE



Source: U.S. Department of Agriculture, Economic Research Service, May 1995.



Source: U.S. Department of Agriculture, Economic Research Service, May 1995. Note: USDA surveys not conducted regularly.

Every five years the USDA conducts a survey of U.S. agriculture known as the Agriculture (or Ag) Census. In the Ag Census, USDA compiles both state and county statistics. Included in the 1992 statistics are county by county chemical use, fertilizer use and government payment statistics.

The states of Ohio, Indiana, Illinois, Iowa, Nebraska and Kansas were chosen as the study area. These six states were chosen for several reasons. First, they produce a significant quantity of subsidized crops. Not all field crops are subsidized. The most common subsidized crops are corn, wheat, barley, oats, sorghum, cotton and rice. With the exception of cotton and rice all the other crops are routinely grown throughout the mid-west. Soybeans are the one major crop grown in the analyzed region which does not receive direct government payments or subsidies. Because soybeans do not receive government payments they are not included for purposes of subsidized crop acreage.

Second, varying soil and weather conditions will undoubtedly affect the quantity of chemicals and fertilizers which farmers apply. In order to minimize this type of variation states were chosen which have roughly similar growing conditions so that any variations in chemical and fertilizer use due to subsidy participation would not be overwhelmed by geographical causes.

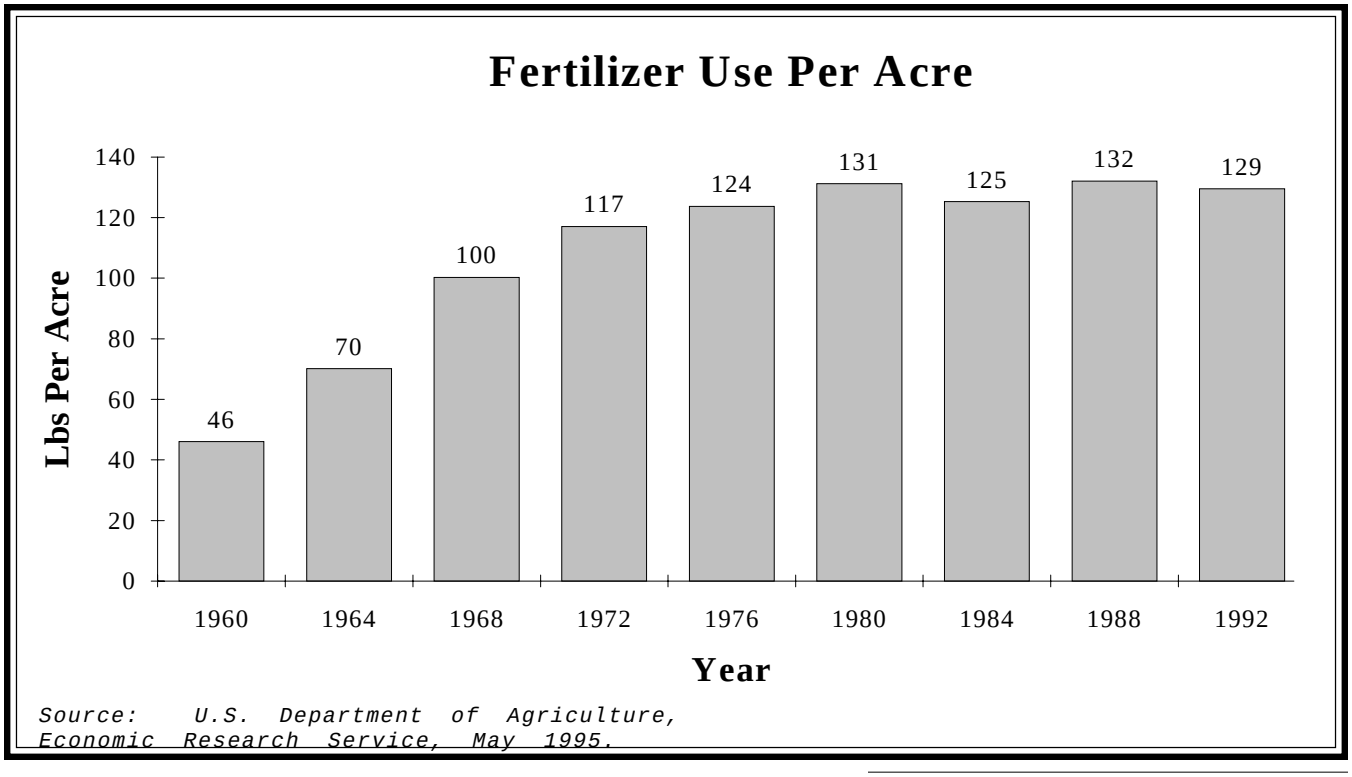
A county by county analysis of the six states showed a significant correlation between subsidies and chemical use as well as between subsidies and fertilizer use. Comparisons are based on the amount of subsidy a county received per acre of subsidized cropland and the amount of chemical or fertilizer purchased per acre of cropland.

USDA statistics do not give the acreage of land in each county which is subsidized. This value was computed by taking the percentage of farms receiving subsidies multiplied by the total harvested crop acreage minus the acres of harvest soybeans in that county.

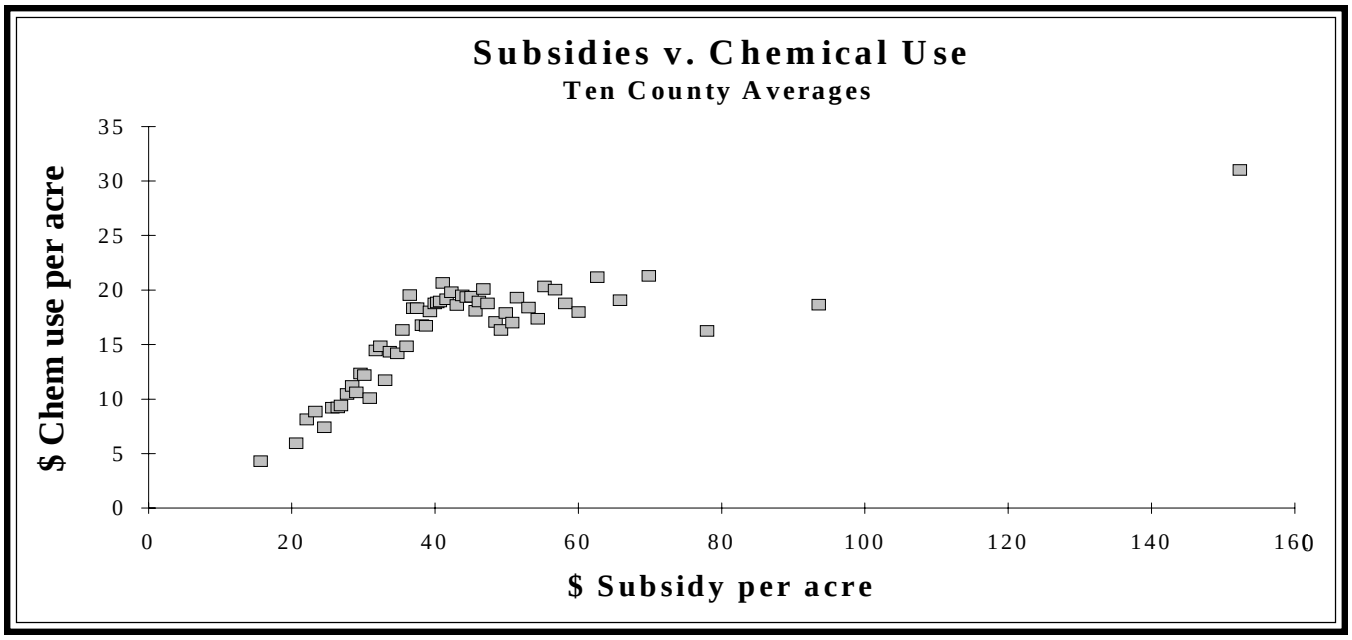
Government payments contribute significantly to intensive chemical and fertilizer use.

Government payments per acre of subsidized cropland for each county are determined by dividing the total amount of government payments received in the county reported in the Ag Census by the estimated farm acreage enrolled in subsidy programs. Chemical and fertilizer rates were similarly computed by dividing the amount of chemicals and fertilizer purchased in each county by the harvested cropland acreage.

Analyses were initially done which compared subsidy rates with chemical and fertilizer levels per acre of farmland. This was considered less accurate as many types of farmland do not use chemicals or fertilizers. Idle farmland, pastureland and dairy farms, although included in farmland acreage, do not contribute to significant pesticide and fertilizer use. Normalizing both subsidy rates, chemical and fertilizer use for the amount of land harvested for crops gives a clearer picture of potential environmental effects of current policies.



Source: U.S. Department of Agriculture, Economic Research Service, May 1995.

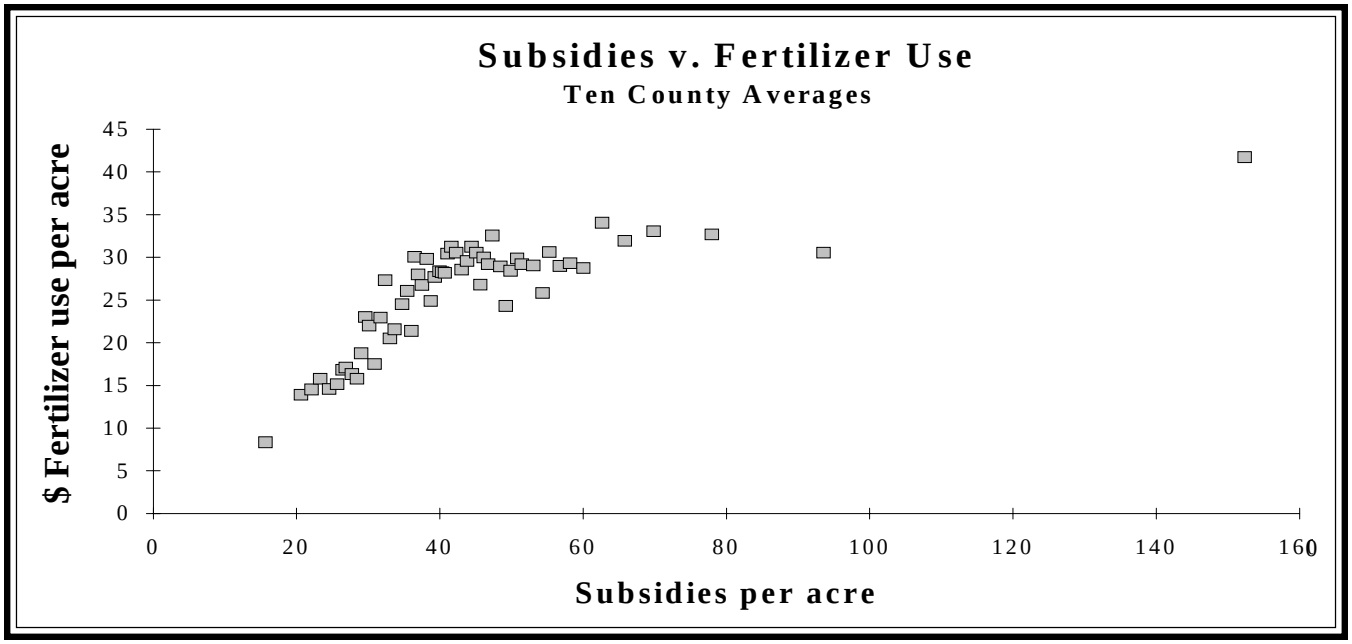


The correlation coefficient of government payments per acre of subsidized cropland versus dollars of chemical use per acre cropland is 0.61 and for fertilizer use it is 0.62. The R squared for chemical use and fertilizer use is 0.37 and 0.38 respectively. This suggests that nearly 40 percent of the variation in chemical and fertilizer use per acre can be explained by government subsidy programs (see appendix #1).

Because there is such variation due to other factors, such as geography, crop type, prevalence of pests and poor soil conditions, an averaging technique was used to further clarify the correlation between chemical and fertilizer use and participation in subsidy programs. All data points were arranged in sequential order according to government payments per acre, in ascending order (i.e. lowest government payments per acre to highest government payments per acre). Every ten data points were then averaged to yield both an average government payment and average chemical and fertilizer consumption. Comparing the ten county averages gives a clearer picture of the effect of subsidies on chemical and fertilizer use. (See charts on pages 11 and 12.)

The complete elimination of subsidies could result in a 35 percent reduction in chemical use per acre and a 29 percent reduction in fertilizer use per acre.

The correlation coefficient for ten county averages is significantly higher, 0.76 and 0.75 respectively. It should be noted that both graphs show that beyond a certain point agricultural subsidies have little or no effect on chemical and fertilizer use. This is what one would intuitively expect. As subsidies are initially offered the incentive to maximize production using non-land inputs is greatest. But as more and more chemicals and fertilizer are used, their marginal benefit is decreased, (i.e. once all the weeds and insects are killed there is little to no benefit from additional pesticide applications.) Consequently, beyond a certain point subsidies do not significantly effect chemical or fertilizer use.



A regression analysis of government payments per acre of subsidized cropland versus chemical and fertilizer use yielded results which suggest that government payments contribute significantly to intensive chemical and fertilizer use. The upper 95 percent confidence interval of the y-intercept, where subsidy payments are zero, is $10.42 of chemical use per acre, and $18.18 of fertilizer use per acre. The average per acre chemical use in the analyzed region is $16.1 per acre, and the average fertilizer use is $25.7 per acre.

The addition of larger quantities of agricultural chemicals to crops does not directly imply increased environmental harm.

The regression analysis suggests that current chemical and fertilizer use is highly intensive due, in large part, to federal commodity programs. In other words, eliminating or reducing the commodity programs would decrease per acre chemical and fertilizer use. This model suggests that a fifty percent reduction in subsidies would decrease chemical use by an estimated 17 percent and would decrease fertilizer use by and estimated 14 percent.

The complete elimination of subsidies could result in a 35 percent reduction in chemical use per acre and a 29 percent reduction in fertilizer use per acre. Although this most likely represents an extreme upper bound, it is not inconsistent with the findings of Painter and Young in North Carolina.[29]

Though suggesting that agricultural policies have a significant on-the-ground effect, in terms of increased chemical and fertilizer use per acre, this model is of limited value in evaluating scenarios of total chemical and fertilizer use. Principally this is due to the fact that as subsidy levels decrease farmers tend to have increased options for crop production. For example, eliminating deficiency payments and the Conservation Reserve Program might mean that farmers would plant more acres of commodity but use fewer chemicals per acre. If enough additional acres were planted more pounds of chemicals and fertilizers might actually be used. On the other hand, more acres might be

planted but the reduced use of chemicals and fertilizers might be so great that even with the additional acreage a total reduction of chemical and fertilizer use may be achieved.

ENVIRONMENTAL FATE OF AGRICULTURAL CHEMICALS

The addition of larger quantities of agricultural chemicals to crops does not directly imply increased environmental harm. The fate of the chemicals once they have been sprayed on the fields has as much or more to do due with actual environmental damage as the quantities of chemicals used. A persistent pesticide, for example, is more likely to cause environmental harm than one which degrades quickly in the field before it has a chance to run off into surface water or seep into ground water.[30]

The environmental benefits of the CRP have been questioned.

It is conceivable that the current policy of reduced acreage could result in less chemicals and fertilizers entering into the surface waters if the land set aside in idling programs acts as a buffer zone, especially between cropland and surface water. The Conservation Reserve Program (CRP) in particular was at least initially designed to serve this very sort of function.

Originally the CRP was fashioned as a program to reduce soil erosion. Under the CRP, land which was considered highly erodible was to be put into the reserve. In recent years, however, the environmental benefits of the CRP have been questioned.

One concern with the CRP has been the proximity of CRP land to surface waters. An analysis was conducted of two Illinois streams to determine the effect of enrollment in the CRP on sedimentation.[31] A total of 15.6 percent of the cropland in the first watershed was enrolled in CRP and 26.5 percent of cropland in the second watershed was enrolled in CRP. Despite these relatively high percentages of enrollment the study found that sedimentation in the two streams was reduced by only 0.0125 and 0.265 respectively. In other words, even though a quarter of the cropland was idle, stream sedimentation was reduced by a mere quarter of one percent.[32] The authors noted that one of the reasons for this apparent lack of reduction in sedimentation was due to the fact that, "few of the CRP enrollments were in stream locations where hydrologic theory indicates they would be most effective in trapping and stabilizing existing near stream sediments."[33]

Acreage idling programs appear to have a negligible pollution control benefits.

Additional studies have shown that this phenomenon is not isolated to Illinois streams. Analysis of the land enrolled in the CRP found that out of 36.4 million acres only 255,000 acres consisted of buffer strips separating cropland for surface waters or wetlands.[34] An estimated 5.5 million acres of buffer zones throughout the nation remain as cropland. To date, acreage idling programs appear to have negligible pollution control benefits.

CONCLUSION

There is considerable evidence to suggest that many agricultural policies have a negative effect on environmental quality. Debate over pollution, particularly water pollution, has turned away from point source and increasingly focuses on non-point source pollution. As a large component of non-point source pollution, agriculture will increasingly come in conflict with environmental regulations. Farmers and farm groups, however, have historically been resistant to increased environmental regulations. One possibility which could both improve the environment and decrease federal spending would be to phase out commodity and other agricultural programs which have been shown to have a detrimental effect on the environment. To date, however, few environmental lobbying organizations have endorsed this approach.

Overall, consumers, taxpayers and the environment would be better off under a free market agricultural policy. Direct and indirect payments to farmers should be eliminated, and all supply control programs should be ended. Several commodities, such as soybeans and potatoes, are currently operated in this way and should serve as models for all federal agricultural policy.

ABOUT THE AUTHOR

Jonathan Tolman is an Environmental Policy Analyst at the Competitive Enterprise Institute. Prior to working with CEI, he was Associate Producer for the weekly television show *Technopolitics*. In 1991, Mr. Tolman served as a Special Assistant for the President's Council on Competitiveness, focusing on environmental and natural resource regulation. In 1992, he worked for the White House as an environmental analyst in the Office of Policy Development. He received his Bachelor of Sciences degree in political science from the University of Utah, and is a doctoral candidate in Evironmental Science at George Mason University. He is also the author of Gaining More Ground: Analysis Of Wetland Trends In The United States.

END NOTES

[1] United States Environmental Protection Agency, *The Quality of Our Nation's Water: 1992*, (March 1994).

[2] T. L. Anderson and D. R. Leal, *Free Market Environmentalism* (San Francisco, CA: Pacific Research Institute for Public Policy, 1991), p. 57.

[3] J.A. Miranowski, "The Demand for Agricultural Crop Pesticides Under Alternative Farm Programs and Pollution Control Solutions," PhD Dissertation, Harvard University. Cambridge, Massachusetts, 1975. Also see Hertel in K. Allen, *Agricultural Policies in a New Decade* (Washington, D.C.: Resources For The Future, 1990).

[4] K.M. Painter and D.L. Young, "Environmental and Economic Impacts of Agricultural Policy Reform: An Interregional Comparison," *Journal of Agriculture and Applied Economics* 26(2) (December 1994), p. 456.

[5] Marc O. Ribaudo, *Program Participation and Chemical Use*, paper presented at the 1994 meetings of the American Agricultural Economics Association, San Diego, CA, (1994).

[6] K. Reichelderfer, "Environmental Protection and Agricultural Support," *Agricultural Policies In A New Decade* (Washington, D.C.: Resources For The Future, 1990), p. 204.

[7] Jonathan Rauch, "Plowing a New Field," *National Journal* (January 28, 1994), p. 213.

[8] Agricultural Stabilization and Conservation Service, *Acreage Reductions, Payment Rates and Participation Levels — 1974-94 Crops*, June 4, 1994.

[9] J.A. Miranowski and M. Cochran, "Economics Of Land In Agriculture," *Agricultural and Environmental Resource Economics* (1993), p. 434.

[10] Agricultural Stabilization and Conservation Service, October, *Conservation Reserve Program*, 1993, p. 9.

[11] C. E. Young and C. T. Osborn, *The Conservation Reserve Program: An Economic Assessment*, U.S. Department of Agriculture, Economic Research Service (February 1990).

[12] M. Kriz, "Mending the Marsh," *National Journal* (March 12, 1994), p. 590.

[13] Ibid.

[14] Ibid.

[15] U. S. Department of the Interior, *The Impact of Federal Programs on Wetlands* (March 1994), p. 126.

[16] Ibid.

[17] General Accounting Office, *Sugar Program: Changing Domestic and International Conditions Require Program Changes* (April 1993).

[18] Ibid, p. 19.

[19] Ibid.

[20] Coale, et al., "Phosphorus in Drainage Water from Sugarcane in the Everglades Agricultural Area as Affected by Drainage Rate," *Journal of Environmental Quality* (January/February 1994).

[21] General Accounting Office, op. cit. p. 12.

[22] Ibid, p. 17.

[23] Department of Interior, op. cit., p. 134.

[24] South Florida Water Management District, *Lake Okeechobee Water Quality Monitoring Report: October 1984*
- *September 1985* (1986).

[25] Reichelderfer, p. 207.

[26] Ibid.

[27] General Accounting Office, *Peanut Program: Changes Are Needed To Make The Program Responsive To Market Forces* (February 1993), p. 78.

[28] L. P. Gianessi and J. E. Anderson, *Pesticide Use in U.S. Crop Production* (Washington, D.C.: National Center for Food and Agricultural Policy, 1992).

[29] K.M. Painter and D.L. Young, "Environmental and Economic Impacts of Agricultural Policy Reform: An Interregional Comparison," *Journal of Agriculture and Applied Economics*, 26(2), (December 1994), p. 456.

[30] D. Mackay and S. Peterson, "Evaluating the Multimedia Fate of Organic Chemicals: A Level III Fugacity Model," *Environmental Science and Technology*, Vol. 25, No. 3 (1991), p. 427.

[31] D.K. Davie and C.L. Lant, "The Effect of CRP Enrollment on Sediment Loads in Two Southern Illinois Streams," *Journal of Soil and Water Conservation* (July/August 1994), p. 407.

[32] Ibid.

[33] Ibid.

[34] Government Accounting Office, *Conservation Reserve Program; Alternatives Are Available for Managing Environmentally Sensitive Cropland* (February 1995), p. 4.