



**American Farmland Trust**  
1717 Massachusetts Avenue, N.W.  
Washington, D.C. 20036 (202) 332-0769

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SOIL CONSERVATION POLICIES-SUCCESES and FAILURES in the U.S.A.

Norman A. Berg, Senior Advisor  
American Farmland Trust  
Washington, D.C., U.S.A.

~~Ottawa~~, Ontario, Canada  
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## Soil Conservation Policies-Successes and Failures in the U.S.

Soil is one of the most important natural resources of any people; yet the United States was almost 160 years old before national legislative action was taken to protect it. Many U.S. people thought, even in the 1930's and later, that the American continent was without resource limits. But there always were, and still are, physical conditions that dictate soil and land use capability, in our Nation and every other.

Soil and water conservation was declared a national policy on farm, grazing and forest lands of the U.S. on April 27, 1935. On that day President Franklin D. Roosevelt signed P.L. 74-46, the Soil Conservation Act of 1935. It had passed Congress without a single dissenting vote.

That same day, Secretary of Agriculture Henry A. Wallace created the Soil Conservation Service (SCS) as a USDA agency. He was able to act so quickly because a temporary agency, the Soil Erosion Service (SES) was already at work, formed in 1933 to do erosion control work as one way of relieving massive unemployment. The U.S. economy, including agriculture, was in the midst of a severe depression and the "Dust Bowl" was growing.

SES had been in the Department of the Interior, under Harold Ickes, but was transferred to U.S.D.A. by the President on March 25, 1935 (a day that Ickes, who was in opposition to the transfer, was reported to be out of town). Secretary Wallace simply directed that the SES become the SCS, and that Dr. Hugh Hammond Bennett remain as Chief (1935-1951).

These events of over a half century ago marked a recognition that conservation of the physical integrity of the soil is a responsibility of the Nation, as well as of individual farmers, ranchers, foresters, and other landowners and land users. This concept still prevails, but the rationale for continued public spending in this area is being tested as never before. The federal deficit is but one of the reasons. Policymakers must give more attention to the why of conservation policy, to formulate defensible positions on this issue. Public spending, especially at the federal level cannot and should not be taken for granted. I'll discuss this challenge later in my presentation.

I note that the Prairie Farm Rehabilitation Administration (PFRA) was also established in Canada in 1935, to deal with the drought and soil erosion problems in the prairie regions.

The earliest efforts of the SCS to set up demonstration projects and curb some of the most serious erosion were greatly aided by the Civilian Conservation Corps (CCC), another activity aimed at unemployment relief through public service. There were thousands of CCC youth enrolled, working on SCS conservation projects on private lands. Many measures for soil loss reduction received their first test.

In February 1937, President Roosevelt sent to the Governors of all states a "Standard Soil Conservation Districts Law" and urged its adoption. The model law provided the opportunity for landowners and operators to organize and govern soil conservation districts as local subdivisions of state government. They were chartered with authorities and responsibilities to plan and carry out soil and water conservation programs. They were to secure assistance from public agencies, based on memos of understanding.

Literally thousands of agencies, private organizations, business firms, and institutions have contributed to the success of soil and water conservation programs, as full partners with the SCS and the people who own and manage the land, over the last fifty years. The progress in soil conservation has been substantial, although problems persist.

Today, the U.S.A. still suffers some very serious soil erosion and water conservation problems. We have been successful in several areas, but we have had our share of failures. I will relate the successful policies first. Then I'll identify some of the weak areas. I will also attempt to point out what is planned to help correct past mistakes and to improve the soil and water conservation programs for the future, in the U.S.A.

#### Soil Conservation Policies that have been Successful in U.S.

-In the early 1900's, recognition of the need for an inventory of soils led to the establishment of the "cooperative soil survey", by the U.S. Department of Agriculture and the State Agricultural Experiment Stations in each of the States and the U.S. Territories. These surveys initiated the process of documenting in detail the wide variation in soils. This data demonstrates that to maintain the productivity capacity of agricultural land requires using land "within its capability and treating it according to its needs". Approximately 80% of the cropland now has adequate soil surveys and new surveys are completed at a rate of about 40 million acres each year.

-In 1914, F.E. Duley and M.F. Miller, with the College of Agriculture at the University of Missouri, established the first experiment to measure the effect of factors affecting runoff and erosion.

-Based on 1929 authorization, U.S.D.A. established 10 soil erosion experiment stations (in 1930) in different regions of the U.S. where soil erosion was a serious problem.

-In 1934 reconnaissance soil erosion surveys were made of all states. This took two months (a windshield survey) and helped define soil erosion as a "national menace".

-From the beginning of on-site assistance to the landusers, a conservation farm plan, based on detailed soil surveys, was developed by SCS technicians for use by the farmers.

-Deciding on measures to adopt and the schedule for applying the needed conservation practices has always been the land-users responsibility. Financial assistance (cost-sharing or credit) has been used as an incentive to help share the cost of establishing certain conservation practices.

-A multidiscipline team was used to develop the practices recommended in the conservation plan. The specifications for each practice was also formulated as the "Technical Guide", for guidance of the on-site work of the conservationist.

-Without a doubt, in the decade of the 1930's, the U.S. soil conservation movement was tied into the performance and lifestream of the SCS and, starting in 1937, was also vested with the soil conservation districts in each state.

\*-The eventual acceptance that well coordinated research, extension (information), financial (credit and cost-share), and technical assistance programs, were public responsibilities, was an important policy determination. Increasingly the basic policy question is what do non-farmers get for the public investment in soil conservation? The easy answer is that we must get something, or the 96 percent of the U.S. population who do not farm, would not have supported the millions of public dollars appropriated for conservation. Soil conservation programs were established in a time of crisis, in the 1930's. However, in times of commodity surplus, declining farm incomes because of overproduction, and no high profile "dust bowls", the crisis is less clear. Clearly off-site damage to soil and water, resulting from agricultural production, is now giving the clearest evidence that public investments and action is needed to protect those who are damaged by soil erosion, but not involved in the activity that caused the problem. This, of course, introduces the role of the landowner, who always makes the major investment in a resource management system. If all, or most of the benefits go to others, why should the landowner practice stewardship? Important to the context for future soil and water conservation policies and actions is the degree to which non-farmers, and many farmers will demand that soil erosion be controlled. There are those who argue that the most subsidized industry in the U.S. should be held to stricter standards of environmental protection. Others, including many farmers, ranchers and foresters, feel it is ethical to expect that those who use the land for their livelihood, not ruin it for the future, not to destroy what has taken centuries to create. Society, because of "quality of life" issues, may move towards the view that agriculture has an obligation to adopt soil conserving practices.

-The voluntary approach of using the carrot instead of the stick, with the landusers has had a long history. The various incentives provided by government, has attracted a large number of landowners to cooperate with their local conservation district. This concept has worked well in many areas.



A more compelling approach to soil conservation is beginning to emerge in several forms. The most straightforward would be through regulation. Several states have varying degrees of mandating that soil loss will not damage others and /or the landuser be implementing soil conserving measures to achieve certain tolerance("T") levels by some future date. Illinois has a concept and system to reach "T by 2000", as one example.

A softer approach includes an array of cross compliance steps that relate conservation to other policies and programs. The recent Food Security Act of 1985 has several features that I'll discuss later. Conservation compliance will not stop soil erosion. Its success will depend on how erosion is distributed compared to distribution of participation in the complying program. It will also depend on how the additional costs of participation for the landuser compare with the benefits of the program that could be denied, if he chooses not to fully comply. The impact of such shifting of responsibility to the landuser must be considered. Any rule that creates greater obligation for farmers could cause higher costs for someone.

-Establishment of a National Resources Inventory process was important to policy decisions. The U.S.D.A. 1977 and 1982 NRI data is now being updated by the 1987 NRI. Field work is now underway and will take about a year. Prior to these recent, highly credible assessments of resource conditions and trends, the U.S.D.A. had only two Conservation Needs Studies. These were not adequate for the changing conditions faced by those who work in Agriculture. The 1977 Resources Conservation Act (RCA), finally provided the authority needed for a more scientific and comprehensive soil and water inventory.

-Finally on successful policy, research on soil conservation is the number one objective of the U.S. Agricultural Research Service (ARS). Each year, Soil and Water Conservation Research and Education Progress and Needs, is published by SCS. This document is the product of State Research Committees working with a National Research Committee, to establish the Highest Priority Needs (HPD's) each year. The 1985 HPD's are:

1. On-site Effects of Soil Erosion
2. Off-site Effects of Soil Erosion
3. Conservation Tillage Research and Education
4. Crop Production Systems for Areas with Limited Water
5. Improved Erosion Prediction
6. Socioeconomic Factors Influencing Conservation Decisions
7. Effects of Intensive Grazing Systems
8. Potential Uses of Microcomputers for Technology Transfer
9. Resource Data Acquisition and Management
10. Increased Use of Warm Season Perennial Grasses

Although U.S.D.A. has provided free technical assistance and billions of dollars of financial assistance to farmers for a half century, to help them combat erosion, there are still U.S. soil conservation problems have not yet been solved.

Soil and water conservation in the U.S. is more than soil erosion reduction. Over the past fifty years, Congress has added authority to the U.S.D.A., including SCS, to work on a full agenda of natural resource concerns. These include the need to improve the condition of the rangelands and native grasses, improve domestic grasses and legumes for use in rotations, or for hay or pasture, and to improve the forested regions of the Nation. The condition of wildlife habitat is increasingly a problem. Water management includes helping on measures where there is too little moisture (irrigation) or too much (flooding). The land effected by salinization increases each year. Preserving wetlands is a major concern of those who support ecosystems. The non-point source pollution problems have introduced a large workload for soil and water conservationists. There are activities to lessen the off-site damage that could be caused by animal wastes, salinity, nutrients, pesticides and sediment (including that caused by urbanizing of rural areas). How land is used, including efforts to retain most important farmlands and unique areas for special crops, is a fairly recent issue that many states and local units of government are seeking answers for, on a priority basis.

#### Failures or weaknesses of U.S. soil conservation policies

Recent inventories (1977 and 1982) show that nearly half of all cropland erodes at rates above the tolerance level, and of that land, an area of nearly 100 million acres exceeds the "T" rate by a factor of two or more. This would be at least ten tons per acre per year of soil loss, if a "T" of 5t/a/yr. were considered as acceptable. Moreover, the U.S.D.A.'s traditional conservation programs seem particularly ill-suited to deal with erosion-prone croplands. The most highly erodible cropland usually requires conversion to a less intensive use, grass, trees and /or wildlife cover, to deal with the soil erosion problem. This concept requires that conservation policy be linked with other policies to be effective. Commodity programs and export promotion have long been identified by soil conservation researchers and farmers as actually discouraging soil conservation. It was not intentional, but several U.S.D.A. "farm programs" created many incentives to use land that resulted in a high soil loss.

Agricultural activities have long been recognized as having a major impact on wildlife. For a variety of reasons, agricultural land use patterns have become less hospitable to wildlife since World War II. This is particularly true in the grain producing regions of the Great Plains and the Midwest, where agriculture has evolved from a mixed crop and livestock operation to a specialized and very intensive production of wheat, corn, sorghums, and soybeans, even mono-culture.

There have been more good solutions to soil conservation problems, more technology available than at any time in history, but it is not being fully utilized. Why is this a problem?

Conservationists have long sought the ultimate technology for protecting the land from soil erosion. Of late, however many professionals have come to realize that government policies, the way in which programs are implemented, and human behavior are often as important as technology. More emphasis is being given to policy development and the implementation of conservation programs as a result. Another way of looking at this issue is to admit that technology is a necessary condition for conserving soil, but not a sufficient condition. More people now recognize the importance of having access to information, the role of institutions, and the barriers to the wise use of soil and water resources. Social scientists, responding to this recognition, have initiated research on many of the behavioral aspects of soil conservation.

**SOIL AT RISK—Canada's Eroding Future—**A report on Soil Conservation by the Standing Committee on Agriculture, Fisheries, and Forestry, to the Senate of Canada; the Hon. H. O. Sparrow, Chairman had many relevant and excellent points. One that relates to the point I have just made is as follows: "the Committee was told that conservation requires a different approach on every farm. Individual farmers would be more likely to engage in new practices if they had access to the right information and technical expertise. But without the qualified personnel to help the farmer overcome the transition from traditional (and often successful) farming methods to conservation practices, the movement to conservation would be much slower. While basic research is an important element in soil conservation, witnesses also cited a need for its practical application at the farm level". A vast amount of information is available. One difficulty is that there is no systematic approach—information transfer tends to be haphazard, the report said.

We have found, even as recently as during the bidding process to enter the Conservation Reserve Program (CRP) in 1986, that some landusers have the erroneous impression that their land would not qualify as being "highly erodible". They have not fully appreciated the degree of soil loss that is taking place from sheet, rill and/or wind erosion each year. In many cases the soil loss exceeds the "T" level by a factor of 3 or more from their cropland annually. However, they do not see large gullies or dust bowl conditions, and feel they have no soil loss problem.

There has been a preoccupation with increased productivity. Research and industry, with encouragement from Government, has pushed annual yields higher and higher, without, in too many cases, sufficient regard for the impact on the resource base. Existing policies, not necessarily directed at soils, can have the effect of discouraging good soil management. Soil conservation cannot be dealt with in isolation from related issues such as land use, water quality, wildlife habitat, forestry and agricultural productivity. There have been too few concerned about the continual regeneration of America's food producing capability. This is beginning to change.



The integration of conservation with agriculture, in all possible ways, will require developing a national strategy for long-term food security that peers beyond the immediate future and local interests.

In recent years there has been an increase in audits and oversight hearings to further pinpoint what works and what doesn't work in U.S. soil conservation programs. One finding is that significant effort and funding for current programs are directed at cropland that erodes at less than 5 tons per acre per year. Yet, the benefits of erosion control measures exceed the costs involved only on eroding at about 15 tons per acre per year and above. More benefits from reducing soil erosion are offsite, realized away from the land itself, indicating the significance of public benefits from soil conservation efforts. There is strong evidence to support several areas of public effort that should be strengthened:

- Improvements in the data base and analytic procedures for evaluating conservation programs
- Continuing efforts, begun in 1981, to target program activities to areas where benefit-cost ratios are the highest
- increasing recognition of offsite damage reduction as a major benefit of U.S.D.A. soil conservation programs
- modifying the conservation program delivery system to target financial and technical assistance to the highly erodible land

A frustrating weakness has been the lack of research on the long-term impact of soil erosion on the inherent productivity of soil. The technology that has increased yields has also masked the effect of soil loss.

The conservation planning process has produced over 2 million farmer, rancher, forester resource management plans. However, the followup with the individual landusers, to provide on-site help for implementation has been weak. As a result, many of the cooperators do not have updated plans. The government has, in too many cases, promised more than it can deliver. Expectations of assistance were inflated beyond the ability to deliver. This relates to the need for targeting assistance, for it will always be limited.

The economic stress in agriculture is, without question, of concern to farmers and conservationists alike. However, I have experienced the good times and the bad times—and conservation has been neglected in both scenarios. Canadian and U.S. farmers are being pushed and pulled in many directions. They do face input costs that are higher, but their equity is falling. The reality is that conservation is not cheap, nor is it a short-term undertaking. Is, as we hear in the U.S. a "cheap food" policy a major roadblock to wise land use and conservation? Does conservation pay, as some say, or is it only stewardship?



The future of soil conservation in the U.S. is first and foremost linked to the future of Agriculture. What will be the long-term capability of our agricultural resources to produce food and fiber? As a society, our welfare depends on the ability of our natural resources to sustain us, our children, our grandchildren, with the basic necessities of life: food, shelter, and clothing. In the past, despite some rocky periods of history, our abundant natural resources have served us well in time of drought, depression, war, and an expanding population. We continue to utilize resources in fixed supply—minerals, petroleum, soil—and the slowly renewing resources—timber, range, pasture—at ever increasing rates. Our population and the world's, continue to grow, exerting more pressure and even more stress on the natural resources base.

The recently enacted Food Security Act of 1985 (12/23/85), has several features that will be important for the future. Included is some linkage of commodity and conservation policy that is a first for the U.S. The new provisions include both incentives—the Conservation Reserve—and disincentives—Sodbuster and Conservation Compliance applying to the cropland defined as "highly erodible. Also, there will be an added disincentive—the Swampbuster—to retain valuable wetlands. These Federal activities are now being implemented and are most promising for the future of soil conservation. To fully explain each provision would be a full seminar. I would be pleased to discuss these programs at your convenience.

The laws and policies now in place will carry us into the next decade. We can fine tune them and even change direction of the programs that have been the foundation of the efforts for the past fifty years, plus the new provisions of P.L. 99-198, but Federal actions do have limits for expansion. Where will these conditions eventually lead us, as we move toward the year 2000?

To develop any type of future scenario requires making some assumptions about several factors: economics of production (presently in need of additional shrinking of capability to produce), demand (domestic and export), and the condition & trends of soil and water resources available for use in agricultural production. A key determinant will be the rate of annual increases in yields resulting from technology.

Domestic demands alone do not, will not unduly stress the natural resource base in the U.S. Therefore, soil conservation would continue to be a desirable activity, probably of lower priority for the federal government. This would place added responsibility on non-federal governments and the private sector for any acceleration of soil conservation—as it relates to the landowners of farms, ranches and forests. This effort could be strengthened by federal matching grants or challenge-type funding for non-federal conservation actions.

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Grants to add to research, extension, financing and technical assistance programs at the non-federal level, has not been an attractive feature for Congress, but it should be considered.

Export demands present a different challenge. In the last few years this has proved to be a very volatile area, depending as they do on global weather and climate patterns, the value of the dollar, global markets and politics. The rapid expansion of U.S. exports of the last decade—tripling in tonnage and sextupling in value—has been followed by a rapid decline. Increases in productivity—worldwide—makes many former importing countries —exporters for the first time in history.

Resources available will be ample for domestic needs, if properly managed and conserved. However, the stress of the past tied to increased exports, could well return and should be the best reason for sustaining a strong agricultural base.

(The setting of tougher priorities for the limited public resources (funding and people) will continue to make sense. Targeting emerged as a central thrust in the National Conservation Plan, an outgrowth of the Soil and Water Conservation Act of 1977. Support for targeting was not universal in 1981, nor is it now. If it could be done with additional funds, instead of redirecting already limited funds it would be more acceptable.

What about the role of Conservation Tillage? It has been a highly cost effective practice at saving oil, toil and soil (in about that order in the minds of the farmer). The simple answer is that it should be the first practice evaluated in conservation planning. There are additional research needs, and the long-term effect of pesticides is still of concern to environmentalists. It is not a panacea, for a resource management system requires other practices. However, all the evidence points to less emphasis on structural measures, that have become increasingly expensive. Those who are examining "alternative agriculture" have increased advocates.

Technology advances will continue, with the proper support for research. Biotechnology is without doubt already having an impact. It is one of the most important features of a long-range future. Excess agricultural capacity will probably grow in the the future. However, the best insurance policy for any nation, to offset conclusions about the future that may prove wrong, is to protect, conserve and pass on to the next generation a soil and water resource agricultural base that will give them the options that we have been afforded in our lifetime.

All Cropland      Cropland EI > 8      Cropland A > 2T, or  
Class VI, VII, VIII  
(Excludes Class I)      Cropland A > 3T, or  
Class VI, VII, VIII  
(Excludes Class I)

million acres

Total	421.4	117.9	104.0	69.4
Less than T	236.0	34.6	6.8	6.8
Less than 2T	324.7	53.9	9.1	9.1
Greater than 2T	96.7	64.0	94.9	60.3
Greater than 3T	59.7	49.3	59.0	59.0
Does not meet cropping history	75-85	27-28	14-15	10-11
Average Erosion Rate T/A per year	7.3	15.2	19.6	24.1