A New Agricultural Policy for the United States

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A NEW AGRICULTURAL POLICY FOR THE UNITED STATES

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Abstract

Because of its unique geography, weather, history and policies, the United States has an agriculture that has been dominated by production of commodity crops for use in animal, industrial and export enterprises. Over time agricultural policies evolved to supported an industrialized commodity based agriculture, with the result that farmers left the land and agriculture moved to an industrial structure.

This restructured agriculture was aided and abetted by many factors. Technology rapidly changed the way land was farmed, leading to less need for labor but also leading to lower returns to farmers because of increased costs and lower prices from the resulting greater production. Farm policies consistently rewarded production over conservation. Continued expansion of row crop agriculture resulted in less land in resource conserving crops, loss of biodiversity, increased water pollution, soil erosion and other environmental damages including major pollution flows to the Gulf of Mexico. While an agriculture that harms its own resource base would appear to be unsustainable, it continued to be promoted by policies that provided major returns to input suppliers and land values but not to the farmer. Global trade issues have emerged to keep prices low.

The 2002 farm bill could mark the beginning of a major change in direction for U. S. agricultural policy. While it continued to support crops through commodity subsidies, many conservation and environmental provisions were included that will, if funded, lower pollution, enhance the landscape, and support small farmers. The new Conservation Security Program promises to financially reward farms for the environmental benefits they provide, and if successful could become the model for a national green payment program. There is hope that it is not too late to turn agriculture into a green, sustainable industry.

Introduction

Attempts to discuss the complex web of farm policies devised by the United States Congress and the U.S. Department of Agriculture typically start at the most recent

legislation. This approach misses the background that has been built into current policies. For we are all greatly affected by our history, even farm policies. And since there is little new "under the sun," it is important to look at the past. This paper moves from the past to the present in order to give hope and direction to the future.

How Did We Get This Way?

The land of the Corn Belt in the central region of the United States is one of the most productive on earth. It was formed during the last great glaciation, about ten centuries ago. The till from the action of the glaciers produced loess, soil moved around the landscape by wind. The native vegetation under which soils were formed modified the soils. The most productive were the soils formed under native prairie vegetation. This young landscape is slowly maturing to a more eroded land surface with more mature drainage patterns. However, over much of the landscape natural drainage remains limited and the soils must be modified by drainage systems that remove excess water from the rooting zone in order for crop production to take place.

The United States Corn Belt has greatly influenced past U. S. farm policy. The productivity of this region, coupled with the policies of settlement by farmers as opposed to land serfs, gave rise to a farming system of independent family oriented farms, relatively self sufficient in their own right. But technology soon began to be a driving factor in the way farms were managed and the way that people interacted with their land.

As technology progressed, there was a gradual development of farming input, processing and marketing sectors, and thus commercial farming began to resemble other commercial economic sectors. In other words, agriculture became more industrial in its form, function and outlook. Aided and abetted by policies at the national and international level, the transformation of agriculture which has been underway for about fifty years has markedly affected the biodiversity of the landscape.

This paper briefly examines the way U. S. agriculture policy evolved to its present state and alternative ways it may go from here. The road is clouded with backroom deals, as well as twists and turns from outside events that can only be termed as chaotic and unpredictable. However, farm size, corporate control of the agriculture sector and federal subsidies have steadily increased, while rewards to individual farmers, farm numbers, and rural communities have decreased,. Is this good or bad? We think it is not a sustainable road for agriculture to follow. And, we do not think it is an inevitable road. Alternative choices are open if society so chooses.

American Agriculture History: A Brief Look Back

"The farther backward you look the farther forward you are likely to see." Winston Churchill

We will begin by looking at the history of U. S. agriculture, summarized from several overview references [1-4]. The first European occupation of the eastern coast region was the beginning of intensive use of the land for agriculture. The New England Puritans envisaged agriculture as the culture where godly families and communities could

be created and maintained, but they also had a pragmatic outlook. Independence from England brought a new awareness of a national agrarian identity. This was embodied in Thomas Jefferson's agrarian philosophy that Americans had the requisite virtue to make republicanism a success because most new Americans were farmers. Jefferson concluded that *"those who labor in the earth are the chosen people of God, a chosen people whose breasts he has made a peculiar deposit for substantial and genuine virtue."* Jeffersonian agrarianism remains to this day an important component of our national rural identity and is embedded in farm politics and policies.

The U. S. moved out of the colonial period with the advent of the Revolutionary War. The new nation had undeveloped land and natural resources, but needed income from agricultural exports. The first U. S. agricultural policy was to exploit the abundant land and natural resources to produce tobacco and lumber for export. Agriculture continually moved west as the land was over-exploited and soils became depleted.

As a result, a need arose for ways to farm the productive forest and grasslands of the Midwest. The U. S. Congress developed policies such as the Homestead Act to increase settlement of the lands in the middle of the country by giving land away. Technology began to come into play with the invention of the steel moldboard plow, allowing draft animals to increase their value and productivity to the farmer, and hastening the conversion of prairie land to crop land. Railroads, another technological breakthrough that helped open up lands to movement of people and products, were established in the 1830's.

By the end of the Civil War in the 1860's, government policy had moved even more strongly to enhance the agriculture economy. The Civil war had destroyed the slave labor system of southern agriculture, further strengthening the change from local subsistence farming to commercial agriculture. Commercial crops expanded, both for export overseas and for use in agriculture economies outside of the main production areas. This required a more complex economy, one more dependent on banking, capital, manufacturing of farm inputs and mechanization. Over time the loss of small farms became apparent.

But intensity of production in the farm sector was stagnant. With the end of the era of westward expansion, scientific methods became recognized as the way to increase production. A new scientific based agriculture was spurred by the formation of the U. S. Department of Agriculture (USDA) and the unique Morrill Land Grant College Act in 1862. The latter provided land in each state to fund schools that would offer courses in agriculture and the mechanical arts. This was the forerunner of the great U. S. system of colleges of agriculture. The information developed by these colleges was transferred to farmers through the extension systems established by the Smith-Lever Act of 1914. As a result of these forward thinking policies, scientific agriculture became a function funded by the public, in contrast to the private funded agriculture research in England and Germany. New pressure was put on farmers to follow the recommended industrialized path developed through research. This brought about tensions between farmers and government experts that have not been resolved to this day (see [5-6]). Public universities are often seen as promoting corporate priorities instead of an unbiased forum for debate on what research is in the public interest.

The technology treadmill, where many quickly adopt innovations, quickly eliminated any advantage to adopters and instead increased input costs. The technology treadmill continues to this day [7].

By the late 1800's, many farmers were active players in commercial agriculture, producing for sale off the farm as opposed to producing only for on-farm consumption. Some farmers joined willingly and some were forced into the market. Farmers lost control of market prices at that time and have never regained control. Commodity prices, while variable, have continually trended downward. While farmers protested low prices by formation of organizations, they never were able to organize effectively enough to influence markets. There was plenty of blame to go around, but mostly the large-scale forces of industrial marketing and the development of technologies by the USDA and the land colleges took the blame. More recently the global nature of all trade, especially agricultural commodities, has aggravated the low prices farmers receive for their efforts. Technology continued its march with the development of petroleum powered traction machines (tractors) that gave enhanced mobility to farm operations and enabled farmers to expand their energies to more land and more enterprises. Other key developments included hybrid corn (maize) largely adopted by 1950, and chemical fertilizers and pesticides. Soybean became an important second crop in rotation with corn by the 1980's, crowding out perennial legume crops and forages [8,9]. The land of the prairie and savannah became the land of the row crops with declining environmental and social attributes becoming noticeable. And throughout this time, government policies continued to support this conversion through commodity subsidies, development of new technologies, and dissemination of information on production practices.

The animal agriculture sector responded to the increased supply of grains by converting from small land based operations to confined systems, shifting to larger and larger operations in order to consolidate market power and efficiency of purchased inputs. Corporate agriculture moved into the animal scene by supplying inputs and animal genetics, providing capital through the use of grower contracts, and more recently controlling processing and marketing of products. This model is fully operational for poultry and increasingly for swine. The vertical and horizontal concentration of the animal industry is ongoing worldwide [10,11].

As U. S. farmers are confronted with low prices, they respond by reducing overhead and labor, and by ensuring markets for their production. This has resulted in ever increasing size of farm operations, leaving the remaining operators with little time for "luxuries" such as biodiversity, environment and rural development.

Agriculture policy has always been touted to save the family farm by putting more money in the farmer's wallet [12]. But agriculture economics has never been straightforward. Farm income has fluctuated widely from a high in the 1910-1914 era to disastrous lows in the depression of the 1930's. A major reason for low farm prices has been overproduction interspersed by regional droughts, recessions and depressions. Each time of agriculture price depression, more farms were lost. These farmers did not return during the time of higher prices, the movement away from family farms seemingly a one way street. A public outcry periodically arose to save those farms left, but policies almost never succeeded in adding farms to the landscape.

Government policies to influence environmental and natural resource conservation practices of farmers have been increasing since the 1930's. The prolonged

drought of that decade and the accompanying "dust bowl" brought on legislation to form the Soil Conservation Service and to begin programs for soil erosion control and removal of highly erodible lands from production.

While government involvement in environmental issues varied, financial and technical support was only a small fraction of the level of funding for commodity subsidy programs. Starting in the mid-1940's, programs designed to save the family farm had the unintended consequence of lavishing the greatest benefits on the largest producers. These programs were designed to diminish risks confronting commercial producers by limiting production to keep prices supported, but resulted in encouragement to produce crops that were already in oversupply, thus keeping prices low. They discouraged diversification and rewarded monoculture and over application of inputs, causing environmental harm. And they encouraged the technology treadmill, farm consolidation and rural depopulation experienced to this day. The publicly sponsored research in the land grant complex and the USDA, and the dominance of agribusiness corporations in U.S. agriculture accelerated the expansion in farm size and lessened of the number of family farms [6].

The next major economic downturn occurred in the 1980's when many farms failed because of over expansion during the boom days of the 1970's. This time the media took up the cause and many stories appeared in the television news, press and movies on the plight of farmers and the environmental consequences of large-scale farming. The government went back to policies to support prices rather than control production, again encouraging overproduction. The shift to industrial agriculture continued.

Many environmental issues surfaced, including off site effects of soil erosion, large-scale animal confinements, pesticides, water quality deterioration by pesticides, sediments and nutrients, food safety, and biodiversity. "Feed the World" became a rallying cry for industrial agriculture, and the success of the green revolution was highly touted as the vision of a new agriculture for food-short developing nations. The 1996 Freedom to Farm bill, designed to use market forces to influence farmers' production decisions, was attempted and failed. Farming continued in a low-income mode, with commodity prices continuing to fall world wide because of excess production and distorted trade policies. Environmental quality issues continued, and social and economic problems of farm and rural communities reached crisis proportions. Still, the government attempted programs to save the family farm while supporting and enhancing the production capability of agriculture, which resulted in more overproduction [13]. As we will discuss later, the latest U. S. agricultural policy as expressed in the 2002 farm legislation (including the Conservation Security Program) offers hope of beginning the movement away from the commodity traps and technology treadmills of the past with stronger emphasis on environmental concerns, organic and alternative agriculture, and energy production.. However, farm income policy interventions continue to concentrate on supporting a few commodities, namely corn, wheat, rice and cotton.

Advanced technologies have made the U.S. farmer the most technically proficient in the world. But these technologies can readily be exported. Consistently, the technical advantages of the U.S. farmer are compromised by rapid worldwide adoption of western world know-how. As productivity increases world wide, commodity prices continue to fall. It is, as is often termed, a race to the bottom by those who farm the land. The future

direction of U. S. agriculture is complicated by the continued increase in world trade, the export of technologies to emerging export producers such as Brazil and China, and the declining power of farmers in political decisions. Further subsidies of agriculture in the U.S. and Europe distort commodity prices worldwide and often greatly inhibit agriculture in developing nations.

We end, I think, at what might be called the standard paradox of the twentieth century; our tools are better than we are, and grow faster than we do. They suffice to crack the atom, to command the tides. But they do not suffice for the oldest task in history; to live on a piece of land without spoiling it" Aldo Leopold [14]

Structural Changes in U. S. Agriculture

The trend over time in the economics and structure of agriculture has predictably resulted in fewer farmers and larger farms. In Iowa, a state still undergoing large structural change, the number of farms has declined 60% in 50 years while the number of very large farms continues to increase (Table 1.) In the decade of the 90's the number of U.S. hog farms dropped 70percent and the number of dairy farms dropped 37 percent [41]. The number of U.S. farms fell from 7 million to 2.16 million since the 1930's, resulting in only 170,000 farms accounting for 68% of production today [42]. These farms produce most of the commodities. Gardner [7] states, "In 1996 farms with more than $250,000 in sales (less than 10 percent of all farms) accounted for more than 85 percent of farm income." All indications are that this trend to larger size farms will continue if agriculture becomes even more industrialized.

Table 1. Farm numbers and farm size in Iowa over time*

Year	Total farms	Farms 50-500 acres	Farms > 1000 acres
1900	228,622	192,341	340
1930	214,928	185,092	134
1950	203,159	173,802	254
1969	140,354	114,254	1,012
1987	105,180	66,627	3,724
1997	90,972	55,443	5,887

*U. S. Census of Agriculture

Development of farm policy brings into question the definition of a farm and the purposes of farm policy. Officially the definition of a farm is one that has over $1,000 gross income, which includes many small "hobby" (or lifestyle) farms [7, 15]. At the other extreme, only ten percent of farmers take two thirds of government payments. If agriculture subsidies are not stopping the attrition of the family farm, then why subsidize commodities for large farms? Why not change priorities and put the money into environmental and rural development projects? Why not pass policies that challenge agricultural market concentration and protect fair and open food markets? The answer lies not in common sense approaches but in the lobbying power of corporate agriculture. The situation might be improving based on the 2002 farm policy legislation, but as usual the devil is in the details, and rules and funding are still being worked out.

The corporate control of agriculture exists with nearly all products and a few corporations control not only processing and marketing, but also increasingly production [10, 11, 16, 17]. Table 2 presents some concentration data for the U. S. Any commodity where four or fewer industries exert over 60% control has the makings of a price cartel. Farmers have no market price control, and consumers, over time, will pay higher prices as competition diminishes. Subsidies that go into commodities do not stay with the farmer but are moved to higher land and input costs. This is a major driver behind the desire for the corporate lobby to push for continued commodity programs as opposed to putting public money into environmental goods and services.

Table 2. Concentration of Agriculture Markets in 2002*.

Beef packers - 81%	Flour milling - 61%
Pork packers - 59%	Corn exports - 81%
Pork production - 59%	Soy exports - 65%
Broiler production - 46%	Soy crushing - 80%
Turkey production 45%	Ethanol production - 49%
Food retailing – 60%	Grain handling - 60%

*Values are the percentage of the market by the top 4 firms in each industry. Data from Hendrickson and Heffernan[11]

There are other examples of concentration in agriculture among the input suppliers in particular [10, 16]. The seed industry is increasingly in the hands of a few companies capable of carrying out the biotechnology that has largely taken over today's

markets [17]. And seed prices have risen accordingly. Only two major farm equipment manufacturers exist today in the United States. Increasingly, fertilizer and pesticide suppliers are concentrated to a few large firms. Contract farming, where a corporation hires a farmer to produce a certain product for a set price, is on the increase [10].

The concentration of industries in agriculture has a disrupting effect on competition in the agricultural sector [10]. It is increasingly difficult for the farmer to operate independently because input costs are established, produce returns depend on pre-arranged contracts rather than open markets, and there is little opportunity for competitive bidding. The farmer in essence takes the lowest price because they have no clout. The farmers share of the food dollar, in the form of price for his product, dropped 36 percent from 1984-1998, adjusted for inflation [42]. Only one of every five consumer dollars finds its way to the farmer [42]. While collective action would seem to be called for, producers have not been willing to trade independence for collective action. Harl [10] states, "The time may be near when that (collective action) will be the only practical alternative to vulnerability and serfdom".

Is the increasing corporate agriculture structure sustainable? Indeed one cannot see how this structure can hold over the next century because it is so heavily dependent on fossil fuels, taxpayer subsidies, and environmental externalities [18, 19]. Future students of agriculture may well wonder how we ever made such a mess of things.

One thing about the current situation is certain, conservation on the land is more difficult because of the costs involved to the industry [9]. It is simply more economically efficient to farm large tracts of land with large equipment, while habitat for wildlife, diverse plants and water quality improvements get in the way [20]. If conservation amenities are to be paid for in government programs, then the question of whether large farms once again will get the bulk of the money must be addressed. While it may appear to be good for the environment, it gets in the way of the family farm and in the long run fuels consolidation trends that are negative to environmental goals. There are no easy solutions, especially if U.S. policy continues to rely on volunteer approaches to environmental and conservation practices as opposed to regulatory approaches that would force externality costs on the producer.

Environmental Costs Accelerating

The environmental costs of industrialized, fossil fuel dependent agriculture are significant [8,9]. The current pattern of large-scale row crop and animal agriculture is contributing to surface water pollution, groundwater pollution, hypoxia zones, increased flooding, depletion of groundwater, air pollution, excessive odors, climate change, loss of wildlife habitat, degradation of natural ecosystems, loss of pollinators, loss of soil quality, and soil erosion.

The leading concern is water quality, because the primary cause of surface water pollution in the U.S. is agriculture, which contributes to 70% of impaired rivers, 49% of impaired lakes and 27% of impaired estuaries [21]. Nutrients and pesticides are endemic in drinking waters, and often nitrate is above public health limits [22]. Lakes and streams are overly fertile, leading to low water quality and loss of biodiversity. Concentrated

animal feeding operations dominate the poultry and swine industries, leading to nutrient overload problems in regions where these industries dominate [23, 24] .

Trends are generally not improving, though some environmental indices may have stabilized at their current problematic levels. Nitrogen fertilizer use has been approximately level over the past fifteen years in the upper Mississippi River basin [25]. Total manure production is level, but concentration into feedlots has led to manure spills. Over three million fish were killed in 250 manure spills in five states bordering the upper Mississippi River from 1995-1998 [26]. In general, the nitrate level of streams draining agricultural watersheds continues to increase [27].

Erosion has not improved since 1995, leveling off at 1.9 billion tons per year, mostly generated in the Midwest [28]. Soil erosion, a cost in productivity in the long run, also is a major short term cost as soils clog ditches, fill lakes and reservoirs, and fill the skies on dry windy days. These soils carry pollutants such as phosphorus, metals and pesticides. Meanwhile, average rates of pesticide use per acre are increasing, and U.S. pesticide sales have increased steadily, topping $7 billion in 1995 [29].[i] The massive National Water Quality Assessment Program found two or more pesticides in almost every water and fish sample collected from streams, and in about half of all wells sampled [30].[ii]

Excessive use of antibiotics in animal feeding operations has led to greater antibiotic resistance in pathogens, creating a looming public health issue. Emissions of noxious gases from animal waste operations have affected the health and well being of those directly in the wind-shed of the operations [24].

The environmental challenges of the current system of agriculture are often interrelated. Impacts may jump from one category to another. For example, evaporation of agricultural pesticides, nitrogen and methane into the air results in deposition of those same substances in rainfall, leading to another avenue of surface water pollution, as well as contributing to climate change [31, 32]. Excessive soil erosion leads to sedimentation of streams with resultant water quality and aquatic biota problems, and the sedimentation of stream bottoms, reservoirs, and lakes results in flooding which then causes more erosion. It is fruitless to target individual environmental “symptoms” when the entire system is “diseased”.

A key “canary in the mine” indicator is hypoxia (very low levels of dissolved oxygen in waters that lead to declines in higher life forms such as fishes and shrimps) This is often referred to as a “dead zone” although some life forms continue to exist. Dead zones in ocean estuaries are caused by the loss of oxygen due to nutrient input, which stimulates excessive algal growth. This algae subsequently decomposes, using more dissolved oxygen than can be replenished. In the Gulf of Mexico, pollution flowing down the Mississippi and Atchafalaya Rivers from the farm belt in the Midwest has caused an annual zone of hypoxia the size of New Jersey, up to 8000 square miles and increasing [33, 34]. Hypoxia has been associated directly with nitrate nitrogen loss from the increase in row crop farming, fertilizer use and artificial tile drainage in the Mississippi River basin farm belt [27][iii]. A government supported assessment indicated that the hypoxic zone could be reduced in volume if the output of nitrogen could be lessened by 30% [33]. This promises to be a difficult target to achieve [34].

Meanwhile, far upstream where corn and soybean dominate in the Midwest, farmers who apply nitrogen and manure to fertilize their crops have a difficult time

connecting with the problems in the Gulf that are affected by their actions. They have gotten used to applying "insurance" levels of nutrients to their crops, knowing that some will be lost due to spring melt, denitrification, ammonia volatilization , and spring rains. Another problem is figuring how much nitrogen to use. After years of science, agronomists still do not agree, and recommendations are in flux because of changes in crop patterns, increases in crop yields, and changes in climate [25, 27]. It is an inexact science with much room for error. Because crop prices are low while fertilizer has been relatively cheap, it made economic sense to use an excess to ensure economical yields. Farmers do not realize that their runoff, when combined with smaller amounts from cities and industry, is causing an environmental disaster far down at the end of the Mississippi River. But fertilizer use itself is only part of the problem [25, 27, 34].

Dramatic changes in the landscape of farming have unwittingly contributed to hypoxia in the Gulf. The increased nitrate loading to the Gulf of the past 25 years has been accompanied by a reduction in acreage of hay, pasture, and small grains which would have kept more land in resource conserving cover vegetation [9]. An increase in planting of soybeans in rotation with corn means that row-cropped land leaves soil exposed to more runoff potential. More drain tile is installed every year – 20,000 miles in Minnesota alone in 2000. This hastens the amount of water draining from the soil and increases the amount of nitrate that moves into streams and rivers. Although livestock numbers have remained steady, the change to concentrated feedlots increases the concentration of manure in small areas, reducing nutrient recovery by crops, and simultaneously driving the demand for more corn-soybean animal feeds, rather than using more environmentally benign hay and pasture to feed livestock. The inefficient system loops back on itself.

In the case of hypoxia, it is not the nitrogen use per se; it is the entire system of corn-soybean farming with its attendant drainage, annual tillage, loss of cover, and decline in soil quality. Dr. Gyles Randall, a University of Minnesota scientist who has spent his career studying these issues in the field, concludes, "The intensive corn-soybean rotation is not sustainable" [44]. There is no doubt that better management of nitrogen fertilizer by farmers and conservation tillage practices could help reduce runoff without reducing yields or profits, but even full implementation of such best management practices may not be sufficient to significantly reduce the Dead Zone. Broader landscape changes are needed to significantly reduce nutrient losses [25].

Loss of biodiversity is huge and costly [35,36] but not easily documented beyond the mammals and large plants of the pre-settlement days [35] Because U. S. soils and landscapes are rugged, forgiving and productive, these losses, which many fear will haunt us for centuries to come, are hard to recognize and appreciate on a daily basis. Biodiversity losses are virtually ignored in farm policies, especially with the current private property rights politics that dominate national U. S. leadership. While the public strongly supports water quality, as shown by many polls, the current approaches to control water pollution from agriculture are modest, and rendered ineffective by poor enforcement, insufficient funding and lack of long-term commitment. Alleviation of these problems is unlikely to come from environmental regulations, and will come only from policies supporting incentives and structural changes in the cropping and animal feeding operations in intensive agriculture areas such as the Midwest farm belt.

Best Management Practices Not the Solution

The U. S. Environmental Protection Agency defines Best Management Practice (BMP) as "A practice or combination of practices that are determined to be the most effective and practicable (including technological, economic and institutional considerations) means of controlling point and nonpoint pollutants at levels compatible with economic and environmental quality goals" [37]. BMP's are often proposed as the best way to reduce non point source pollution. However, many question if this concept can adequately address multiple interacting sources of agricultural impacts, including nutrients.

The complexity and interrelatedness of agriculture's environmental problems leads to rejection as ultimately ineffective the policy choices that try to isolate and address one problem at a time. Multiple government initiatives each focused on one problem, such as on pesticides, on erosion, on nutrients, on wildlife – are doomed to fail, for three reasons. First, they will not create environmental health even if they do achieve a reduction in a single pollutant because only a few "symptoms" can be ameliorated by adoption of BMP's alone. Second, there will never be enough political will or financial resources to launch the number of discrete programs needed. Finally, the BMP approach will fail because farmers are unable to respond to conflicting BMPs and regulations for multiple problems within the context of their current farming system –they will ignore it, fight regulations, and society does not have the political will to force them. The farmer can only effectively address major environmental impacts when solutions are integrated into their specific farming system. Some form of whole farm planning is needed to bring multiple solutions into reality on the farm [38].

Toward a New U. S. Farm Policy

Before the 1996 farm bill, all farm bills used various schemes to pay farmers a higher price for a few selected commodities in return for reducing production by not planting some acres of the farm. This was done to increase prices by control of production. The 1996 Farm bill tried to end that policy approach. Instead, fixed payments were supposedly on a six-year transition schedule toward the elimination of government support, to let the "free market" set prices unimpeded by government policy. But falling prices and declining government payments would have sentenced too many farmers to bankruptcy, so Congress intervened and made sure the money continued to flow -- $28 billion in 2000, accounting for half of all money made by farmers. In eight states – including four in the corn belt – governmental aid made up 100% of net farm income [39]. A policy vacuum resulted, transferring taxpayer dollars to farmers but requiring very little in return. The attempt to get government out of agriculture was a complete failure, but it was a good deal for absentee landowners, input suppliers and manufacturers and global grain traders. And these were the very groups who strongly lobbied for the 1996 farm bill.

If a farm were only valued by society as a unit of commodity production, then Congress would have let the 1996 farm bill run its course along with the free market and lost another generation of farmers. However, the reason Americans care about farmers and rural communities goes further than the mere production of cheap food. A farm is the economic flywheel for rural communities. It can produce beautiful landscapes and environmental protection. For many, it is core to the very ideal of democracy. The myriad functions of the working landscape have value to society, functions for which many are willing to pay, either through taxes or through food prices.

A recent national poll by a consortium of land grant universities documented this broad support for agriculture's multiple benefits. A clear majority of consumers (71%) would be willing to pay more for food grown locally, rather than far away. Even more (81%) would be willing to pay more for food grown on farms using good environmental practices. A similar majority (76%) believe that government policies should focus on helping small farms, and family owned and operated farms. In contrast, only 25 % say that corporate, non-family farms should get government help. Even when it affects food prices, the majority(59 %) feel that family farms should be supported, and more than half (53 %) say they are willing to pay more for food that is "grown on small farms rather than large farms [40].

This vision of the 'multi-functional' benefits of agriculture opens the door to a new rationale for government support – to reward good stewards of natural resources who conserve biodiversity and safe-guard the sustainability of production for the future [38].

The Conservation Security Program

The 2002 farm bill was resolved by a remarkable compromise among conflicting visions. It seemed unthinkable that Congress or taxpayers would support continuation of the fixed payments, emergency payments, and commodity price subsidies as a perpetual entitlement to commodity crop growers, with no policies to alter the prospect of an endless bailout. Nevertheless, Congress did just that, passing the largest commodity title ever, including a continuation of both fixed payments and commodity price subsidies, while raising the maximum amount any single farmer could receive.

However, at the same time, the farm bill embraced a new direction, nearly doubling conservation spending and creating a revolutionary new holistic conservation initiative called the Conservation Security Program. In a manner not all that unusual for democratic compromise, the two competing visions were both moved forward simultaneously. Crop subsidy spending will total $125 billion over the next ten years, including new funding of $47 billion, while conservation spending will total $39 billion, including $17 billion in new dollars, according to estimates by the Congressional Budget Office.

Stewardship incentives, sometimes called green payments, are an alternative farm policy intended to create profitable farms that protect the environment by rewarding the conservation benefits achieved by farmers. In the future, stewardship incentives could become the alternative to some or all of the current system of commodity based payments. For now the Conservation Security Program is an additional option for

farmers who voluntarily choose to enroll. The new program was championed by Senator Tom Harkin of Iowa, who became Chairman of the Senate Agriculture Committee at the time the farm bill was negotiated, and was shaped by numerous sustainable agriculture and farm groups. At the time of this writing, rules are being written and the first signup is expected in late 2003.

The vision for the Conservation Security Program (CSP) is to reward farmers who voluntarily implement effective conservation on their working lands, thus integrating production of economic products and environmental benefits on the land. The goal is to improve a robust range of environmental concerns, including surface water quality, groundwater protection, air quality, fish and wildlife habitat, energy conservation, soil quality, biodiversity, and genetic preservation. Farmers will receive annual payments as they provide public benefits to the nation's natural resources and environment. Participants will solve critical resource problems while receiving graduated rewards for increasing efforts.

The CSP envisions a farming systems approach and will eventually move toward a performance and outcome-based reward structure. Both current and new conservation practices and systems will receive incentives – thus recognizing the good stewards of today while encouraging others to join their ranks. Note that farmers who have long maintained good conservation practices will not be left out, and those who have done little will not be disproportionately rewarded for fixing their problems. In previous programs funds were largely targeted to remediation of poor practices, annoying those who did it on their own. The highest rewards in the CSP encourage sustainable land, energy, and resource use over the long term, including diversified resource-conserving crop rotation systems, managed rotational grazing systems, conservation buffers and other multiple benefit conservation measures.

In contrast to conservation programs that retire farmland from production for conservation purposes, the CSP is designed for working farms and ranches, and is intended to simultaneously support conservation and economic production on the land.

All regions of the country and all types of agriculture can participate on a fair and equitable basis, including livestock, fruit, vegetable and organic farms. No longer will commodity producers have the advantage. Payments per farm will be capped at a modest amount annually so that large farms will not benefit disproportionately, but support will be ongoing for the life of the individual five to ten year conservation plan and contract, and contracts may be renewed.

The CSP is the first conservation program designed as an open-enrollment entitlement program, in the same category as commodity subsidies. With an open enrollment program the demand for the program drives actual funding levels rather than being subject to the whims of the appropriations process that could leave some otherwise eligible farms without benefits. All is not perfect, however. Congress subsequently placed a ten year funding cap on the program. If this cap is not removed the goal of automatically enrolling all farmers with approved conservation plans, without competitive bidding or waiting lists, would be jeopardized. Substantial funding will be necessary to implement the program. Beyond funding for payments to farmers, adequate resources will be required for outreach and education to farmers; additional agency staff and training; and on-farm planning assistance by conservation professionals, third party consultants, non-profits, and experienced farmers. Already demands on the nation's

finances to support military commitments, and the decline in revenues from the poor economy and tax cuts, are threatening the funding levels for the CSP along with a host of other government programs.

The CSP will base each contract on a conservation security plan in which the farmer documents a combination of practices designed to resolve one or more of the natural resource concerns identified specifically for that site. On-farm and watershed level monitoring and tracking of environmental improvements will be an important part of the program. On-farm research and demonstration of new or not widely adopted systems and practices will be encouraged.

In sum, the CSP will be the most innovative and exciting program in the federal agricultural conservation toolbox, and could become a critical new component of U.S. farm policy for years to come. A second and equal goal of the CSP is to improve income for farmers. While part of the benefits reimburse farmers for conservation costs, other parts financially reward farmers for participating and reaching high levels of sustainability. The CSP will begin life in 2003 as a revolutionary conservation program for working lands that financially rewards farms for the numerous environmental benefits they provide. If it proves popular and successful at reducing agriculture's environmental impacts, then it could become the model that will be expanded into a national green payment program that will displace some significant portion of the failing commodity subsidy policies of the U.S. CSP could well be the beginning of a transformation in US policy.

How CSP Works

The Conservation Security Program is structured around three tiers, from which farmers may choose a level of involvement based on their own stewardship goals.

Tier I: Annual payments up to $20,000 for resolving to a nondegradation level at least one of the identified natural resources of concern on a selected part of the farm.

Tier II: Payments up to $35,000 annually for resolving to a nondegradation level at least one identified resource of concern on the entire farm.

Tier III: Up to $45,000 annually for resolving to nondegradation level all of the identified resource concerns on the entire farm.

The one practice excluded is manure storage, partly because such facilities are usually required by feedlot regulations, and partly to prevent subsidizing further concentration of livestock into confinement operations. Manure management and land application are eligible practices for all

Each locally approved conservation security contract will result in annual payments combining three payment components, but not to exceed the cap for the selected Tier. A **base payment** consists of a per acre payment for each acre covered by the conservation plan, based on a graduated percentage of the average rental rate. $5000 is the maximum base payment for Tier 1, $10,500 for Tier 2, and $13,500 for Tier 3. A **cost-share payment** covers up to 75% of the costs of installing new practices or maintaining existing practices. Beginning farmer costs are covered up to 90%. An **enhanced payment** will be a bonus to reward exceptional conservation plans that exceed requirements, address additional resource concerns, conduct research and demonstrations, are part of a larger watershed project, or include monitoring and assessment. The law specifies that diversified resource-conserving crop rotation systems, managed rotational grazing systems, conservation buffers and other high payoff, multiple benefit conservation measures will receive enhanced payments.

Leverage Points for Future Change

Fiscal resources: An expanded green payments program such as CSP should not be viewed as competing for scarce conservation dollars. It must be viewed as an alternative way of distributing some portion of the commodity subsidies. The money would still flow to support farmers, but Americans would be getting something in return: a cleaner environment. Public concerns about farm subsidies are increasing, with media attention focusing on payments accruing to large corporate and absentee owners.
Favorable Trade Rules**:** The Conservation Security Program is likely to gain momentum because it is a farm policy that fits the future. U.S. trade commitments at the World Trade Organization obligate farm policy to move toward subsidies that do not distort trade under WTO rules. Export subsidies and production limiting programs are subject to severe limitations. The CSP seems to fit into the "green box" of allowable farm subsidies directed to legitimate environmental concerns or other forms of domestic support that do not influence trade.

Water Quality**:** Federal and state agencies are moving forward to address pollution from nonpoint sources, including the leading source which is agriculture. Impaired watersheds may undertake a process of allocating responsibility for pollution reduction to various sources. Agriculture is sure to be a major source in many watersheds, and watershed plans to reduce those pollution loads will have to be developed. The CSP provides an avenue for significant money to flow to farmers to help reduce their pollution without the need for onerous regulations and the resultant political backlash**.**

Geographic Fairness and Public Support**:** The likely distribution of payments under the CSP will differ from current patterns of farm payments. Some areas that have not benefited from commodity programs might do better under the CSP. A base of support for stewardship incentives comes from urban and suburban voters who care about farmers, but care a lot more about the environment. Farmers wishing to transition to organic, or carry out their organic certification plan could use the CSP as a major means of support, thereby building the support of the organic industry and organic consumers.

A New Vision for Diversification of the Agriculture Landscape:

One focus of a pervasive new policy of conservation payments should be diversification of agriculture land use. Longer crop rotations, including resource-conserving crops and more pasture acreage, are for the key to significantly reducing pollution flows and other environmental ills. Cover crops, rotational grazing, perennial pastures, energy crops, and improved soil biological life are also part of the new landscape picture. To be specific, corn and soybean and other monocultures must be interspersed with resource conserving crops in four to six year cycles, and livestock must graze more pastures and be fed more forages.

The biggest barriers to diversification in agriculture are mainly economic, and driven by past policy decisions, but they are not inherent in geography. For example, Minnesota produced 34 different commodities in 1920, but now focuses on only a

handful, and Iowa has even less diversity of cropping. A recent listing of Minnesota – grown opportunities included 174 crops and 42 types of livestock that are feasible [41].[iv] In highly populous Illinois, the "green industry", producing ornamental landscape and indoor plants, surpassed corn and soybean production in economic importance in 1999, with $2.9 billion in sales compared to $2.6 for corn and $2.1 for soybeans, on a fraction of the acreage [43]. It is widely recognized that U.S. farm policy, namely the subsidies for a handful of commodity crops, is the primary force driving over-specialization.

Qualities of a Diverse Cropping System

No one can presume to name the ideal crops to take the place of corn-soybean dependence, because it will vary by farm, by farmer, and by markets. The elusive "third crop" espoused by some is a poorly named goal, because it only extends the current lack of diversity. Many crops should be included in rotations. While there is not one answer for all farms, it is worthwhile to explore the attributes of a sustainable system.

Over the landscape, on average, there must be a much longer period of soil vegetative cover during the year, including earlier growth in the spring, faster growth in early summer, and soil coverage through fall and winter. This will reduce erosion and weed germination. More nutrients must be fixed by legumes and applied in organic mixes such as manure and compost, in order for it to be held more tightly in the organic matter of the soil. Three to six year crop rotation sequences will disrupt pest, disease, and weed cycles, thereby diminishing the need for pesticides. Crop rotation also has a beneficial effect on soil fertility as different rooting structures extract nutrients at varying depths. The quality of the soil will be improved with cover crops, forages and perennials to increase organic matter and maximize soil biotic life. Perennial plants must be established on the most vulnerable hills, riparian buffers, and erosive soils to protect the soil from rainfall and runoff. Nature should be encouraged to take over some parts of every farm, in the form of wetlands, stream buffers, woodlots, wildlife corridors, and other habitat in order for wildlife and natural ecosystems to flourish.

The qualities of a sustainable system as described above can only be met in two ways: either with diversified crop rotations, or with perennial systems such as grazing or agroforestry. Diversification is the key that unlocks the possibilities beyond monoculture row crops, and it can be met in dozens of cropping systems. A rotation can add resource conserving cover crops, spring growing perennials, legumes, spring annuals, winter annuals, cover crops, and other options. Bringing livestock back into many operations is another key to new crop opportunities, so livestock can again become the consumers of pastures, forages, and a significantly wider array of feed grains, such as oats, barley, and buckwheat.

Current Barriers to Diversification

Some of these diversified options are not new. They have been extensively used in years past and still are by many sustainable and organic farmers. Indeed, some regions including the hillier areas of the Midwest are still dominated by diversity and smaller,

integrated livestock farms, though the numbers are declining. Suitable growing conditions are not a significant barrier. Minor barriers exist in finding suitable seed strains, appropriate equipment, and technical experience, but these are relatively easy to remedy. Indeed, innovative farmers are increasingly adopting newer practices such as fall cover cropping, no-till and perennial energy crops. The primary barriers to diversification are interrelated: lack of ready markets for anything besides corn and soybeans; low prices for alternative crops; and a government policy that subsidizes only a few commodities. These three facets result from one government policy and drive corn-soybean dominance in this region. A belief that agricultural exports should be the means to balance our trade deficit as well as the solution to oversupply is probably a primary underlying reason for such policies with their unintended landscape consequences.

New green payment policies such as the Conservation Security Program offer the incentive to diversify the landscape precisely for the environmental benefits that are produced by diversification. Other reforms are still badly needed for commodity programs that now offer opposite incentives to maximize row crop production.

Summary

Because of its unique geography, weather, history and policies, the United States has an agriculture that has been dominated by production of commodity crops for use in animal, industrial and export enterprises. Over time agricultural policies evolved to supported an industrialized commodity based agriculture, with the result that farmers left the land and agriculture moved to an industrial structure.

This restructured agriculture was aided and abetted by many factors. Technology rapidly changed the way land was farmed, leading to less need for labor but also leading to lower returns to farmers because of increased costs and lower prices from the resulting greater production. Farm policies consistently rewarded production over conservation. Continued expansion of row crop agriculture resulted in less land in resource conserving crops, loss of biodiversity, increased water pollution, soil erosion and other environmental damages including major pollution flows to the Gulf of Mexico. While an agriculture that harms its own resource base would appear to be unsustainable, it continued to be promoted by policies that provided major returns to input suppliers and land values but not to the farmer. Global trade issues have emerged to keep prices low.

The 2002 farm bill could mark the beginning of a major change in direction for U. S. agricultural policy. While it continued to support crops through commodity subsidies, many conservation and environmental provisions were included that will, if funded, lower pollution, enhance the landscape, and support small farmers. The new Conservation Security Program promises to financially reward farms for the environmental benefits they provide, and if successful could become the model for a national green payment program. There is hope that it is not too late to turn agriculture into a green, sustainable industry.

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