



Overview / History

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The North Dakota Natural Resources Trust (the Trust) initiated Conservation Agriculture (CA) in 2000 to develop sound, workable methods for improving farm economics while promoting private water storage, natural resource conservation and improvements to wildlife habitat. CA sponsors invested \$1.1 million, including \$600,000 from the Trust, to conduct the program.

The mission of CA is to demonstrate how a holistic team approach to farm planning, which includes economic, environmental and social considerations, enhances profitability while conserving natural resources for wildlife and society. The first year of the program, 2000, was for planning and organization; on-farm demonstrations began in 2001 and will conclude Dec. 31, 2005.

By the spring of 2005, after four complete growing seasons, the program has demonstrated quantifiable benefits for farmers, rural communities and the environment. The positive results have implications not only for farming operations in North Dakota and across the country, but the development of future farm programs that make sense both for farm families and society as a whole.

Background

Agriculture is the primary industry in North Dakota. In 1997, 68.6 percent of the state's land was cropped and 26.4 percent more was in pasture or rangeland.

Economics drive land use, and it has become increasingly difficult for farmers to sustain a living. Extreme weather has caused flooding, as well as a high incidence of disease and insect populations. Commodity prices have been and continue to be low, while the costs of inputs, many of which are petroleum-based, continue to rise. The current, conventional system of production agriculture will not be able to continue long term.

Most farmers are not opposed to preventing soil erosion, improving soil structure, implementing a diverse crop rotation or setting aside unproductive wetlands for wildlife habitat. However, many view these practices as economically unfeasible, and pressure to make a profit continues to force them to attempt to squeeze earnings from marginal acres. Some farmers request permission to drain wetlands for more farmable acres in order to produce more commodity bushels. Small, seasonal wetlands are particularly at risk of being altered. Unfortunately,

drainage and cultivation of wetlands cause significant changes in wetland biological communities.

Meanwhile, farmers willing to engage in conservation programs have found it increasingly difficult to initiate and maintain practices. For example, implementing specific conservation measures can be cost-prohibitive due to the loss of productive acreage, however marginal. Other hurdles include farm commodity and federal crop insurance programs that promote market-driven crop rotations of corn and soybeans. As a result, if a farmer chooses to implement a long-term diversified crop rotation or other conservation practice, he assumes all the risks.

The farmers' struggle impacts rural communities, which are largely supported by the agricultural economy.

Conservation Agriculture

CA was born out of numerous meetings of diverse stakeholders drawn together to discuss water issues that affect the Red River and Devils Lake Basins. Roger Hollevoet, district director of the U.S. Fish & Wildlife Service (USFWS) Devils Lake Wetland Management District, and Ray Horne, a farmer and member of the Trust Board of Directors, developed the concept and a plan to implement it after listening to farmers who attended those meetings. They presented their plan and brought it to the Trust in July 1999.

The basic tenet of Conservation Agriculture is that only the best land on a farm should be in production. "Farm the best, alternatives for the rest," is the program's tagline. The program allows participating farmers to set aside less-than-prime farmland for conservation uses, provides payments for those acres, and enables them to focus expertise and inputs on the most productive soils.

The objective of CA is to develop and implement programs that increase the profitability of agriculture while promoting private water storage and conservation. Newly adopted practices make farming more efficient by lowering input costs through decreased use of fuels, herbicides, and fertilizers. At the same time, alternatives on less productive acres provide a host of societal functions within the watershed, including, but not limited to, wildlife habitat, flood management and decreased erosion. Finally, the program demonstrates that farmers are willing to make changes that protect the environment when conservation options are economically feasible.

To initiate the project, The Trust formed a 13-member, multidisciplinary Advisory Board to manage it. The Advisory Board included eight farmers/landowners and five agency representatives – one each from the Trust, the NDSU Extension Service and the USDA Natural Resources Conservation Service, and two from the USFWS. The Board developed 10 land-treatment/payment programs to respond to the needs farmers identified.

From a pool of 26 applicants from the Drift Prairie Region, the Advisory Board engaged four farm families and their operations in the five-year demonstration to:

- Protect natural resources while maintaining a profitable farm economy.
- Improve communication between wildlife agencies, conservationists and agricultural producers.
- Improve quality of life for people who live and work on the farms.

The families are Tom and Kathleen Langemo, Fingal, N.D.; Clark and Susan Lemley, Hope, N.D.; Darrell and Deborah Odegaard, Egeland, N.D.; and Bruce and Sandy Teubner, Cando, N.D.

Each family was assigned a seven-member Resource Analysis Team of agricultural, economic and conservation professionals. Teams include an adult farm management instructor, an agricultural economist, an agronomist, a soil scientist, a district conservationist, a wildlife biologist and a quality of life specialist. This approach recognizes that every individual at the table has a different area of expertise, and working together leads to the creation of realistic, comprehensive, and implementable plans that produce desired results.

The Resource Analysis Team meets with the farm family at least twice a year to design and implement a whole farm plan that addresses economic, social and environmental characteristics of sustainability. Plans include everything from soil nutrients to farm efficiency. Quality of life for farm families is central to the planning process, placing major emphasis on keeping them on the land to restore environmental health within the framework of production agriculture.

Results

During the project, qualified specialists monitored the following on each farm:

- Aquatic Species
- Avian Species
- Carbon Sequestration
- Farm Management Records
- Soil Nutrients
- Soil Quality
- Soil Salinity
- Water Quality

In addition, a USDA agricultural economist tracked the economic performance of the four farms and trends relative to regional averages.

Environmental

- All four farms have an increase in organic matter in their soils. Tests show that fields with higher levels of organic matter and better soil aggregation often have improved yields and better crops.

- A new rotational grazing system on the only operation that includes livestock has optimized grazing efficiency by stimulating grass growth and regeneration, providing better soil structure, and increasing water infiltration.
- There has been an increase in bird breeding behavior on all four farms, with one farm demonstrating a 21 percent increase in bird breeding behavior from 2001-04. The incidence of birds breeding rather than just passing through is one of the key indicators of successful habitat change.
- Avian species diversity has improved, with faltering and uncommon species observed on all four farms and nesting increases observed among common species.
- Water quality has improved on all four farms. A demonstration project on one farm quantified the positive water quality impacts of grass filter strips.
- Wind and water erosion have decreased on all four farms due to no- or reduced-till practices and the increase in residue left on the soil.
- More carbon dioxide greenhouse gas is being stored in the protected wetlands and crop residue.

Economic

In evaluating differences between the CA farms over the five-year project period and regional averages, David Archer, USDA agricultural economist, found that the clearest economic trend has been a decrease of the average total percent indebtedness for three of the four farms. Total percent indebtedness is a key indicator of financial viability. Other economic findings include:

- All four farms have a total percent indebtedness lower than the regional average.
- Seed, chemical and fertilizer expenses per cropland acre, an indicator of reliance on purchased inputs, are lower than regional averages for three of the four farms.
- Spring wheat yield, an indicator of long-term sustainability, has exceeded regional averages on three of the four farms. One was statistically significant in absolute terms and relative to regional averages.
- The portion of cropland planted to spring wheat, an indicator of diversity, is typical of regional averages.
- Government payments as a share of farm expenses, an indicator of reliance on incentives for economic viability, average only 10.5 percent of total.
- Conservation payments as a share of total payments were 45.8 percent of total at the end of 2004, dramatically higher than regional averages.

Communication

Beyond the economic and conservation benefits realized through CA, the project's team approach to farm planning provides a model for improving communication between farmers, landowners, conservationists and government agencies.

The project has demonstrated that Resource Analysis Teams lead to improved communication that builds trust, or at least a greater willingness to listen to and hear differing opinions. This increased trust provides tangible benefits for all parties, the farming operation and the environment.

All too often relationships between farmers/landowners and conservationists/agency representatives has been adversarial. In fact, each of the four farm families that eventually participated in CA needed to be convinced that it was worth trying, and they did so only after being assured that they, and they alone, would make all decisions for their farms.

Their reticence stemmed from historical experience in which, from their perspective, conservationists and agency representatives have been unwilling to listen to their viewpoints, recognize their economic needs or tailor programs to changing circumstances. Many farmers and landowners have lived with conservation program rules and regulations that affect pesticide application, soil and wetland management, as well as laws that protect wildlife that destroys their livestock and crops and hunters that trample their fields. Meanwhile, from the perspective of many conservationists and agency representatives, farmers have made resource management decisions from a purely economic viewpoint with no consideration of impacts to lands, wetlands and wildlife.

Former North Dakota Gov. George Sinner attempted to address this problem in the early 1980s in work that led to the Garrison Diversion Reformulation Act of 1986, through which the Trust was formed. Sinner challenged water and wildlife groups to work together to determine how wetland and agricultural interests can thrive together, side by side.

CA continues that effort. Through the project's Resource Analysis Team structure, participating farmers, conservationists, and agency representatives have gained deeper understanding, not only of landscape functions but of each other. Working together, they've been able to develop mutually beneficial methods for protecting resources while maintaining a profitable farm economy.