The Clean Water Farms Project: Purpose, Goals and Objectives

The purpose of the Clean Water Farms Project was to increase the number of farmers and ranchers in Kansas adopting farming practices that address non-point source agricultural pollution. The project sought to provide good examples or models of low-cost, management based clean water farming practices, easily adopted by others. The transfer of this information and the establishment of a network of farmers who understand responsibility in water quality protection was a critical aspect of the project.

From the beginning, the project emphasized the need for innovative, management based solutions as opposed to structural solutions such as terraces, waterways and lagoons. These practices are extremely important, but they have been the focus of state and federal programs over many years. We wanted to expand the way farmers approached water quality protection. Also structural solutions are often expensive, and we wanted to explore lower-cost management based solutions.

For instance, many farmers use livestock manures as fertilizers, either to cut back on purchased fertilizer costs or to remove it from their feedlots. But most, including sustainable and organic agriculture's producers, need to pay more attention to the way in which they use the manure. Timing and incorporation and soil and manure testing can be more of a management issue than a structural solution. They must certainly be combined with structural solutions.

Eligible practices included:

* **Development and implementation of legume based, crop rotations to reduce pesticide and fertilizer use;**
* **Use of cover crops to reduce fertilizer needs and reduce erosion;**
* **Use of grass buffer strips or riparian filter strips, and stream bank stabilization, to reduce erosion and filter out pesticides and fertilizers from reaching water bodies;**
* **Livestock managment systems that reduce confinement feeding and pollution potential including: management intensive grazing systems and related fencing of paddocks; conversion of cropland to grass; alternative watering systems and stream crossings to limit livestock access;**
* **High residue cropping systems;**
* **Feedlot manure management systems that limit runoff potential; soil and manure testing and analysis for application for crop needs, composting, and site re-design and management practices;**
* **and Consumer education, marketing and purchasing of food raised under clean water farming practices.**

With guidance from an advisory team made up of farmers, representatives from Kansas State University Extension and the Kansas Department of Health and Environment, a farm financial analyst, an independent agricultural engineer, and KRC staff, we identified a range of management based practices that would be eligible for cost-share and technical assistance. Farmers could apply for up to $5,000 in cost-share assistance. The project advisory team reviewed all applications and made selections for funding.

The project also provided planning and implementation assistance and educational opportunities through farm tours, field days, workshops and presentations. Farmer to farmer transfer of information played a critical role in getting other farmers involved. KRC's experience is that farmers often respond best to another farmer who is actually doing it. Hands-on, in-the-field experience cannot be replaced or replicated. The CWFP worked closely with the KRC's existing Heartland Sustainable Agriculture Network of groups of farmers around the state to provide farmer to farmer information via farm tours, workshops, and conferences.

River Friendly Farm Environmental Assessment

Implementing one practice or making one structural change does not address all of the water quality or environmental concerns a farm is likely to have. Also the farmer or rancher first needs to recognize the problem or threat of a problem before they will take any action. Though we see increasing awareness of water quality problems, many still fail to understand that what they do on their farm affects water quality downstream and contributes to a cumulative effect. Likewise, there may be several options for addressing a problem-- each with a different economic impact.

Midway through the project, KRC identified the need for a farmer friendly environmental assessment and planning process that would take into account the whole farm's impact on water quality, help the farmer identify his or her farm's strengths and weaknesses, and help prioritize work to begin solving the problems. Additionally, we needed to find a way to help farmers choose the best options financially.

In close partnership with Kansas State University, KRC developed an environmental assessment tool, the River Friendly Farm Environmental Assessment to do just this. Many of our Clean Water Farm demonstration farms participated in pilot testing the assessment, identifying further steps they can take on their farms to protect the environment and help their bottom line.

The assessment has such promise in helping farmers take a "whole farm planning" approach to their farms, that KRC developed a follow-up project called "Clean Water Farms-Whole Farm Planning Project: A Priority Watershed Approach". This project will help farmers in high priority Kansas watersheds complete the assessment on their farms, develop action plans and request cost-share assistance. This project began in late spring 2000 and will continue to establish good examples of clean water farming practices around the state.

Water Quality Monitoring

Common sense tells us that many of the management changes that the CWFP farmers and ranchers adopted improved water quality on their individual farms, or at a minimum reduced the threat to water quality. Obviously, seeding erodible cropland to grass can reduce the amount of soil erosion and sediment into streams and rivers. Soil testing and proper applications of fertilizers (including livestock manure) and herbicides, or adopting other best management practices, can reduce the risk of heavy rains carrying these into streams and lakes.

Don Huggins, Kansas Biological Survey, explains a groundwater sampler and the testing they are conducting on the Bruce Spare farm to farmers.

Timely incorporation of livestock manures after application on cropland can reduce run-off if a rainfall event occurs. Testing the nutrient content of manure and soil testing soils for soil needs can ensure that over application does not occur.

Providing livestock an alternative to drinking from the creek reduces or eliminates the time cattle spend in riparian areas and the subsequent damage to both streambanks and water quality. Adopting grazing management systems that decrease the time livestock spend in confined lots can also reduce the concentration of livestock manures and the risk of pathogens and fecal coliform bacteria in run-off.

Other water quality concerns associated with improper livestock management include nutrients (nitrogen and phosphorus) which can increase vegetation and algae in water bodies. Excess vegetation and algae can reduce the ability to use the water body for things like fishing or drinking and can increase the cost for such uses. Excessive nutrients can also disrupt the balance of the aquatic system. Eroded soils from cattle trails, overgrazed lands, and uncontrolled congregating areas can result in premature silting of lakes and ponds. Finally, chlorides (salts) can build up in animal manure and discharge into our water resources, potentially impacting aquatic life.

The project went a step beyond promoting management changes by providing a unique opportunity for scientists to explore water quality concerns and changes on individual farms.

Farms Selected for KBS Monitoring

Steve Burr, Saline County
Management Intensive Grazing (MIG) & Alternative Livestock Watering System

Dan & Mary Howell, Marshall Co.
Conversion of Cropland to Grass; and MIG

Alan Hubbard, Pottawatomie Co.
Alternative Livestock Watering System

Tim Kunard, Miami County
Conversion of Cropland to Grass

Bruce Spare, Saline County
Cropland to Grass and MIG

Jim, Julia and Richard Townsend, Dickinson County
Conversion of Cropland to Grass

Herb Bartel, Marion County
Resource Conserving Crop Rotation

Rod Peters, Marion County
No Till Crop Rotation

Kansas Biological Survey (KBS) scientists at the University of Kansas received grant support from the Kansas Department of Health and Environ-ment, through the U.S. Environmental Protection Agency Nonpoint Source Program Section 319 Funds, to gather data and information from a limited number of project participants.

All of the farmers involved in the project gave permission for Kansas Biological Survey to monitor water quality on their farms. However, KBS was limited to selecting only eight farms for extensive study.

Each of the eight farms, including six livestock operations and two cropping systems, had a specific sampling program established on-site. In order to analyze the impact of the land management decisions made by the farmers, KBS collected runoff, shallow groundwater, surface water, soils, and vegetation samples and inventoried aquatic invertebrate species. The components of each specific sampling program depended on the nature of the water quality issues addressed by the management decisions, the physical characteristics of the area to be monitored, the goal of the farmer, and the ability to monitor a measurable change. Sometimes that which is intuitively beneficial to water quality does not lend itself to be quantified through monitoring.

Available findings, trends and observations from the KBS study are covered in the Appendix, which offers narrative summaries of each of the eight farms monitored, as of November 2001.

From the outset, scientists knew that monitoring the impact of a management change on water quality on any individual farm would be difficult. Too many upstream factors contribute. Also, it takes several years of collecting data over a variety of conditions before conclusions can comfortably be drawn. However the data gathered from these innovative farms and ranches will help determine the best course for future management on not only that farm, but others.

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In the meantime, farmers and ranchers involved in the CWFP have employed a lower-tech version of monitoring -- the daily and seasonal observation of someone intimately connected to the land. Nearly every farmer or rancher involved has noted at least one or more of the following:

* improved riparian health;
* greater plant and wildlife diversity:
* slower less turbid run-off from new grasslands and croplands with cover crops:
* better soil infiltration with improved soil structure:
* and reduced medical costs for livestock with access to alternatives to creek and pond water.

Profile Summary

The farms and ranches featured in the following pages have been divided into two categories: "Grass and Grazing Systems" and "Crop Rotations and Integrated Crop and Livestock Systems." Under "Grass and Grazing Systems", the practices highlighted may be as simple as planting erodible cropland to native grasses. Or the rancher may have changed the way he or she manages their grassland and livestock. Management intensive grazing (MIG) or intensive rotational grazing was a common goal of many of the participating farmers and ranchers.

Management intensive grazing or rotational grazing can be defined as a system where livestock are moved through a series of pastures or paddocks in timed intervals to make optimal nutritional use of the grasses and to improve the forages. The system also relies on well developed water supplies, often including buried waterlines to move the water along with the livestock, or fencing ponds and creeks to control access. The result is that livestock spread their own wastes over the pastures, are on pasture longer and spend less time confined in wintering lots or in riparian areas, and thus de-concentrate wastes that may contribute to water quality problems.

The second section, "Crop Rotations and Integrated Crop and Livestock Systems", features those practices that seek to reduce or eliminate chemical fertilizer and herbicide run-off, and that integrate use of livestock manures into the cropping system via best management practices. Crop rotations have long been used by farmers to break weed and pest cycles. But a well planned and implemented extended crop rotation can also reduce purchased fertilizer use by substituting nitrogen fixing legumes and/or by applications of manures. The legumes can take the form of cover crops which can also reduce soil erosion and thus reduce the threat to water quality. The resource conserving crop rotations highlighted in the CWFP profiles had to include a five-year written plan with soil building legumes maintained on at least 20% of the crop acres each year.

Many of the farmers featured in the second section adopted not only extended crop rotations, but also made changes in the management of their livestock, adopting improvements to their livestock waste systems, the design of their wintering lots, watering systems, and improving their man-

agement of manures, via soil and manure testing and timely applications to cropland.

Through appropriate management of nutrients, using legume based crop rotations, integrating livestock, forages, cover crops and properly applied animal manures to build soil and reduce erosion, and making water quality protection a primary goal on each farm, we can improve existing water quality and reduce the threats to future water quality.

Nearly all of the participants agree that while they may have completed their obligations to the KRC project, they know they are far from done with their efforts to improve their farms and ranches. It is an on-going challenge in a changing landscape - both environmentally and economically.

While the challenges in agriculture remain daunting to many family farmers who struggle with low prices, high input costs, rapidly changing technologies, and increasingly unclear regulatory expectations, the need to protect our water and soil resources remains constant. As research and studies continue to document agricultural pollution of streams, lakes, and rivers, conflicts will continue to arise between urban citizens, who face costly water treatment solutions and public health concerns, and farmers who fear greater regulation that may put them out of business.

But the choices are not between urban citizens drinking contaminated water or paying higher water bills, and farmers polluting or going out of business. The farmers and ranchers in the following pages are evidence of that. They are on the cutting edge - finding solutions, farm by farm, to water quality problems.

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