



FUNDING FARMER INNOVATION

YEAR GRANT AWARDED: 1998

#### AREA 2: Water Quality

#### PRINCIPAL COOPERATOR

Kim Barker  
Rt. 2, Box 67  
Waynoka, OK 73860  
(580) 824-9011

#### OTHER COOPERATORS

Bob LeValley, Woods County  
Extension Agent, Oklahoma State  
University

#### PROJECT BASICS

*Duration:* Three years (1999-2001)

*Type:* Demonstration Project

*Grant Amount:* \$3,390

*Location:* Five miles east of  
Waynoka, Oklahoma, on Ash Street.



For more information/  
to apply, contact:

Alan Ware, Director OPGP  
Kerr Center  
PO Box 588  
Poteau, OK 74953  
918.647.9123  
fax 918.647.8712  
mailbox@kerrcenter.com  
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OKLAHOMA PRODUCER GRANTS

## PROJECT FACT SHEET

# Protecting Water Quality While Healing Erosion Caused by Livestock Trails



Kim Barker

#### FARM/RANCH PROFILE

Kim Barker's ranch consists of 1500 acres in Waynoka, Woods County, in northwest Oklahoma. He raises cow-calves and stockers.

Raising beef cattle is challenging in an area that normally gets about 22 inches of rain per year and on a ranch where soil ranges from sand to tight red clay. Forages are mainly native grasses such as Big Bluestem, Indian grass, and Little Bluestem.

Barker began practicing cell grazing in 1990. Today, his pastures are divided into more than 70 paddocks. The condition of the ranch has improved dramatically since Barker adopted a holistically-planned grazing system.

#### PROJECT OBJECTIVES

In 1998, Barker was ready to take further steps to improve his land. He proposed a producer grant project to pipe water to the cattle in all his paddocks and to fence cattle out of his ponds. His stated objective was to demonstrate, one, how water quality can be improved in ponds by fencing cattle out of them; and two, how the erosion in livestock trails can be healed by taking water to the cattle. His intent was fivefold:

- 1) To heal the cattle trails eroding the lanes his cattle traveled to ponds and windmills.
- 2) To stop cattle from breaking down pond banks and fouling their drinking water with mud, feces and urine.
- 3) To further improve grazing distribution in his paddocks by decreasing the distance cattle must travel to water.
- 4) To better distribute the nutrients from feces and urine back onto pastures where they act as natural fertilizers.
- 5) To eliminate bare ground on the pond banks, thereby increasing biodiversity of plants and other organisms around the ponds, and increasing the stability of those areas.

#### STEP-BY-STEP PROJECT DESCRIPTION

The first objective, to stop damage to his pond banks and improve pond water quality, was accomplished by fencing the cattle out of one small pond, which was the main source of water on the east end of his property. This pond is shallow and sometimes goes dry in

droughty weather, so it was a poor source of livestock water to begin with, and was continually getting shallower and muddier with livestock traffic.

The second objective, to heal erosion in the lane, was the heart of the project and was accomplished by developing a water system that incorporated a quick-connect point system and a portable water tank that could be moved from paddock to paddock as the cattle moved. This prevented the cattle from using the lane for traveling to water, reducing erosion and improving grazing.

### THE WATER LINE

Barker ran a water line from his house well nearly to the end of his property more than a mile away. The main line followed a central lane he had been using to take cattle to water points and move them from paddock to paddock. Under the fence-line between each paddock he plumbed a quick-connect water coupling, housed inside an 8-inch piece of PVC pipe.

When Barker needs water in a paddock, he moves a portable water tank under the fence and attaches a garden hose between the tank's float valve and the quick-connector on the water line.

His entire water line was laid in 20-ft sections of 1 $\frac{1}{4}$  inch PVC connected with glue joints.



He purchased Plasson connectors from Jako, Inc., in Hutchinson, Kansas, which specializes in fencing supplies and other intensive grazing tools. These quick connectors work somewhat like a hydraulic coupler. The nipple screws onto the end of a hose and can be snapped into or out of the fixture on the line.

Barker used 8-inch schedule 20 PVC for a casing around each underground coupler. These come in 10-foot lengths, which Barker cut into 2-foot lengths to make the casings.

On top of each piece of pipe he set a concrete lid, made by pouring concrete into a form. The casing and lid protects the waterline and couplers from freezing in the winter and from other damage the remainder of the year.

The lids he made by pouring ready-mix concrete into a homemade sheet-metal ring just larger than the diameter of the PVC casing. These he laid on a piece of plywood to give the lids a nice, smooth bottom so they seal fairly well against the PVC casings.

He put handles on the lids by bending one loop up from the end of a barbed-wire spool and laying it in the form so the bent loop stuck up above the top of the form. The stone lids are about two-inches thick

Before he started trenching and laying pipe he pre-made the PVC risers so they were quick and handy to glue into the line.

Barker used 8-inch schedule 20 PVC for a casing around each underground coupler.



Moveable watering tank

### THE WATERING POINTS

Barker's first moveable tanks were too small. He tried another grazier's recommendation of half a 55-gallon barrel, but it did not work. The cattle would drink all the water and turn the tank over. He now uses 4-foot and 5-foot wide round, galvanized tanks. These are still small enough to move on a four-wheeler.

Before moving a tank, Barker unplugs it and lets the cattle drink it down before he finishes draining it and moves the cattle and the tank to the next paddock.

The use of moveable tanks is a tradeoff of some labor for significant expense. It would be handier to have stationary tanks, but that would cost a lot of money, Barker says

Using moveable tanks also gives him more flexibility. It allows him to use the same tank-full of water in two adjoining paddocks. Further, he can have two tanks available per paddock when he has large numbers of cattle and the weather is hot.

A 20- or 30-foot area of ground around the watering points seems to take a real beating. However, these small abused areas in each paddock seem much better than the erosion Barker used to experience in lanes. Today he still uses the lane to move cattle from one paddock to another, and sometimes the cattle graze portions of the lane as if it were another paddock.

## RESULTS

"I'd say we've accomplished what we set out to do in most of the areas," Barker says.

Erosion in the trails is beginning to heal now, although for the first couple of years excessive rains on the sandy soils actually made it worse. As the rainfall pattern has become more normal and therefore more sparse, the erosion has really started to heal.

Once cattle were fenced out of the pond, it healed dramatically. Vegetation covered the bare soil. Although Barker tried to establish shoreline reed grass on the banks, it was natural vegetation that really took over. Those grasses around the edge are helping stabilize the banks and therefore are helping clear up the water. However, the pond recently went dry as it has in past years, Barker adds.

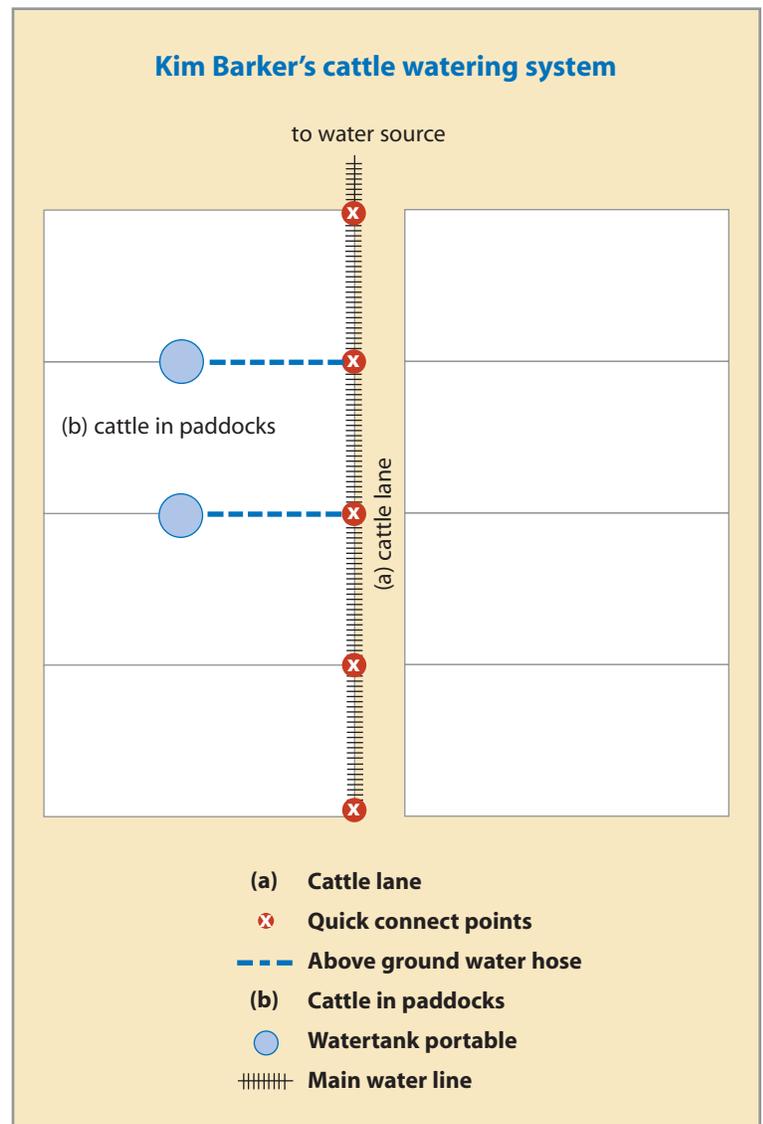
Grazing distribution of the cattle is much better because they're staying in the paddocks rather than going out the gate and down the lane two or three times per day and then lying around the pond. Also because the lane went through some shade, the cattle tended to go lie in the shade and then go back to drink again before going back to graze. This behavior carried a tremendous amount of nutrients into the lane and pond, which now stay in the paddocks.

## RESOURCES

Jako Inc., Ken King, (877) 525-6462 or via his website at [www.jakoinc.com](http://www.jakoinc.com)

## TIPS/LESSONS LEARNED

- Barker said he should have used 2-inch pipe instead of 1 1/4 -inch pipe. He thinks he has too much friction loss and not enough volume in the 1 1/4-mile long line.
- Barker installed the line in November when the days are shorter, and he says that was a mistake. Since he was renting the trencher he could have had more hours for the money when the days were longer.
- Use the right size tank. Barker found he needed a tank big enough the cattle can't tip it over if they drank it down, especially with his relatively low-volume water system. (He also noted that since he began this project he has heard University of Missouri grazing professor Jim Gerrish talk about that problem. Gerrish says as long as cows can see each other they will go to water and drink one or two at a time, but if the ground is rough, or the pastures too large so they can't see each other, they will all come together.)
- Barker placed his water points under the electric fence on both sides of nearly every paddock. This lets him graze two paddocks before moving his water, but it also lets him have water on both sides of a paddock if he wants to, although most often he does not.
- Barker used the well and pressure tank at his house as the main source for the water and says he needs to up-size these when they wear out. Bigger well equipment than is typically used for rural homes would be more useful for a pasture water system.





*FUNDING FARMER INNOVATION*

*Grants Awarded Statewide!*

## OKLAHOMA PRODUCER GRANT PROGRAM

Farmers and ranchers know their land better than anyone else. They know their problems, and they often have innovative ideas about how to solve those problems.

While good ideas may not in short supply, money often is. This program, the first of its kind in Oklahoma, supports farmer and rancher innovation with cash grants.

Established in 1998, the Oklahoma Producer Grant program encourages an exchange of ideas and experiences between producers that will benefit all.

### WHAT IS A PRODUCER GRANT?

- It funds projects that promote a sustainable agriculture and are innovative, unique, and experimental
- Two year grants are funded up to \$3,500, three year grants up to \$7,500

### WHAT KIND OF PROJECTS WILL BE FUNDED?

- Those that address one or more of eight priority areas (some years, special areas are added)
  - Research, demonstration or educational projects\*
  - Research and demonstrations with a strong educational component—results are shared with other producers
  - Projects with agriculture professionals (Extension, NRCS, etc.) as collaborators/cooperators given priority
  - Ideas applicable to more than one farm
- \* A demonstration project is an on-farm demonstration of a farming/ranching practice; a research project is an on-farm test of an idea or technology. An educational project shares information about innovative approaches.

### WHO MAY APPLY FOR A GRANT?

- Active, resident producers in Oklahoma

### HOW AND WHEN ARE GRANTS AWARDED?

- Annually, on a competitive basis
- Proposals are evaluated by an impartial technical committee of ag professionals and producers

### WHAT IS THE APPLICATION PROCESS?

- Producers or producer groups may submit grant proposals once a year during the "Call for Proposals" time period
- Application forms are available from the Kerr Center or online at [www.kerrcenter.com](http://www.kerrcenter.com)

### WHAT IS A SUSTAINABLE AGRICULTURE?

- A sustainable agricultural system will last over the long term because it maintains or increases net farm profit, protects and conserves natural resources, and is equitable to farmers and ranchers.

## 8 Eight Priority Areas and a Few Examples

#### 1. Soil Conservation, Soil Health

Farming methods that stop erosion, increase organic matter, improve texture and structure and microorganisms.

#### 2. Water Quality, Water Conservation

Farming methods that prevent soil erosion or filter pollutants; efficient irrigation systems

#### 3. Proper Management of Organic Wastes

Non-polluting approaches to waste application, composting, new, less concentrated systems of raising livestock and poultry

#### 4. Crops and Livestock Adapted to Oklahoma

New crops or varieties that match climate and soil type, livestock adapted to climate and forage

#### 5. Biological Diversity

Incorporating wildlife habitat, rotations, diversified crops and livestock, cover crops

#### 6. Environmentally-Safe Pest Management

Approaches to weed management that eliminate or cut spraying, methods of insect and disease management that emphasize use of beneficials, biological control agents, or innovative rotations

#### 7. Energy Conservation

Reducing use of diesel or gasoline through lowering horsepower needs, reducing tillage, using renewable fuels, recycling

#### 8. Farm Diversification and Increased Profitability

Cutting expenditures for inputs, adding value to crops or livestock, diversifying farm enterprises, growing crops that receive premium prices, maximizing the use of on-farm resources, substituting management for off-farm inputs, direct marketing

For more information on the program, field events, application, and descriptions of funded projects go to [www.kerrcenter.com](http://www.kerrcenter.com) or call 918-647-9123.