Setting Up a Management Intensive Grazing System

Rock Gremillion

2012

Rock Gremillion was an intern at the Kerr Center in 2012. See his bio on last page.

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Small farmers across Oklahoma are faced with the tall task of remaining viable in an agriculture system that does not favor small-scale producers. The conventional system encourages farmers to take on large amounts of debt with expensive equipment, fertilizers, and herbicides. However, a different approach to management can eliminate many of those costs, all while improving pasture productivity. By focusing on the grass, a farmer can use his/her cattle to keep pastures under control. This approach to farming is called management-intensive grazing (MiG), and at Rock Creek Farm, a fifty-acre plot at the Kerr Center for Sustainable Agriculture, a MiG system was put in place during the summer of 2012. A herd of thirty one Angus and Pineywoods cows and heifers and eight angus/pineywoods cross calves were managed on fifty acres. By further developing the fencing, shade, and water already in place, a higher utilization of pastures was achieved, all while maintaining strong herd performance. These goals will help achieve a vision of providing beginning farmers with a research site that demonstrates a practical and affordable pasture management strategy that lowers costs while increasing pasture productivity**.**

In the 1980s and early 1990s, Rock Creek Farm was a working small farm with a diverse collection of species, ranging from cattle to rabbits to chickens. These animals were rotationally grazed on a half wagon wheel fencing system with water at the central pivot point and trees sporadically located across the property. However, the project was discontinued in the mid-nineties. The property went back into a larger rotation, and as a result, during the last decade and a half, the property has seen very little management; pasture was not monitored or controlled and much of the infrastructure fell into disrepair. At the end of May, Carrie Shirley and I started our internship at Kerr, and were given Rock Creek Farm as a summer project. I immediately looked to set up a management-intensive grazing system, and by the end of July, we had repaired our

fencing, built a moveable shade structure for any treeless paddocks, and installed an above ground waterline that ensured that water was never more than 500 feet from the herd, allowing us to efficiently utilize all of our forage.

In late May, when fellow intern Carrie Shirley and I came to Kerr Center, Rock Creek Farm was well into the spring flush, and because of the warm spring, most of the cool-season grasses were already in phase three growth. Ideally, this situation calls for mob grazing with dry cows, but our herd needed a high nutritional content. We received twenty-three heifers and eight cow-calf pairs. Consequently, our first problem was managing our mature forage while maintaining our cows and growing out our heifers. In order to meet both of these goals, Carrie and I used polywire to move the cattle as many as three times a day, with stock densities upwards of 250,000 pounds per acre; though by July, we had settled into twice a day moves with a more conservative stock density of about 75,000 lb./ac. With a stocking rate of roughly two acres to the cow, we needed to make sure that our grass received the rest that it needed to get at or near end of phase two growth. However, because of the inefficiency of the wagon-wheel in a hot environment, we knew that regrowth would vary greatly between the areas near the water source and areas further out. In order to monitor that growth, I used a grazing wedge to take pasture inventories.

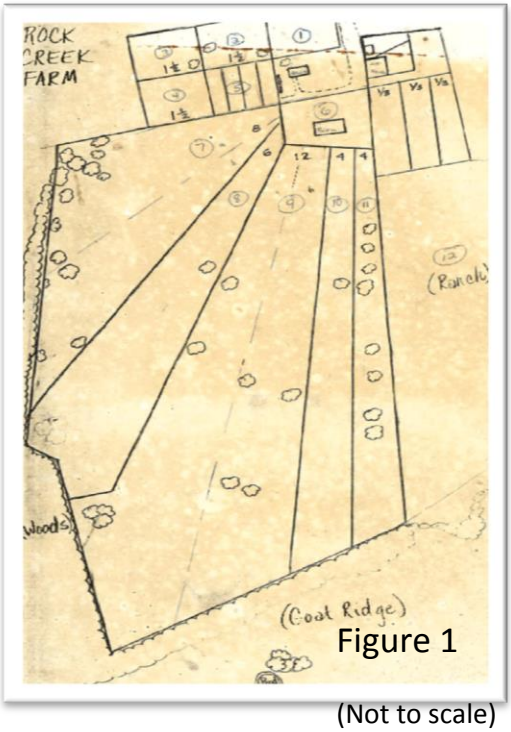
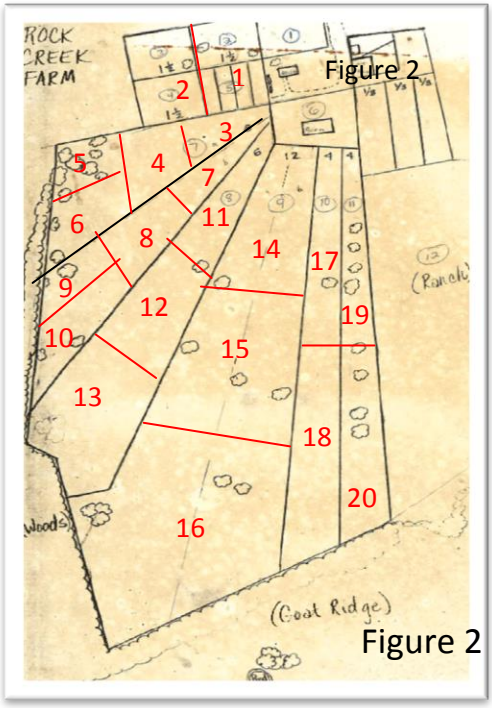


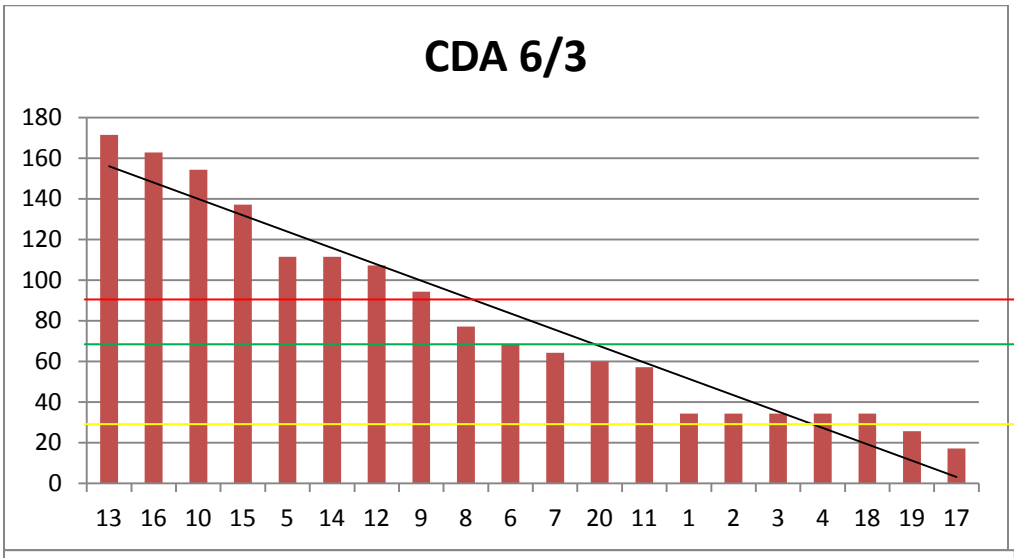
Figure 1
(Not to scale)

Originally, Rock Creek was split into seven grazing cells varying between four and twelve acres (Figure 1). Prior to our arrival, the property

was part of a larger rotation across the Kerr Center, and once every few months, cattle were run concurrently through each cell. The week we started rotating our herd, I went through the pastures and created twenty subdivisions or paddocks, using pink and orange surveyor's tape to mark where one subdivision ended and another began. These paddocks averaged just over two acres apiece, with the smallest and largest paddocks being one and five acres, respectively (Figure 2). Then, I took my first pasture inventory, in which I went through each subdivision, measured the average height of the grass, the density of the coverage, and noted the different species of growing forage. When combined, I was able to calculate the amount of cow days per acre, or how many days a 1,000 lb. cow could spend on one acre. I then entered this data into an Excel spreadsheet, sorted it, and created a graph called a grazing wedge, which ranks the paddocks from highest to lowest. This graph is a very powerful tool for measuring pasture productivity.



Armed with this information, we now had a map of where our herd would go and how long we could expect them to stay in each subdivision. The grazing wedge also helped us to monitor our grass levels, which can provide us with important information like when to start feeding hay in a drought, and in turn, when to put the cows back out on pasture once forage regrowth is into phase two again. The following is a progression of the grazing wedges at Rock Creek Farm over the summer of 2012:


CDA 6/3
180
160
140
120
100
80
60
40
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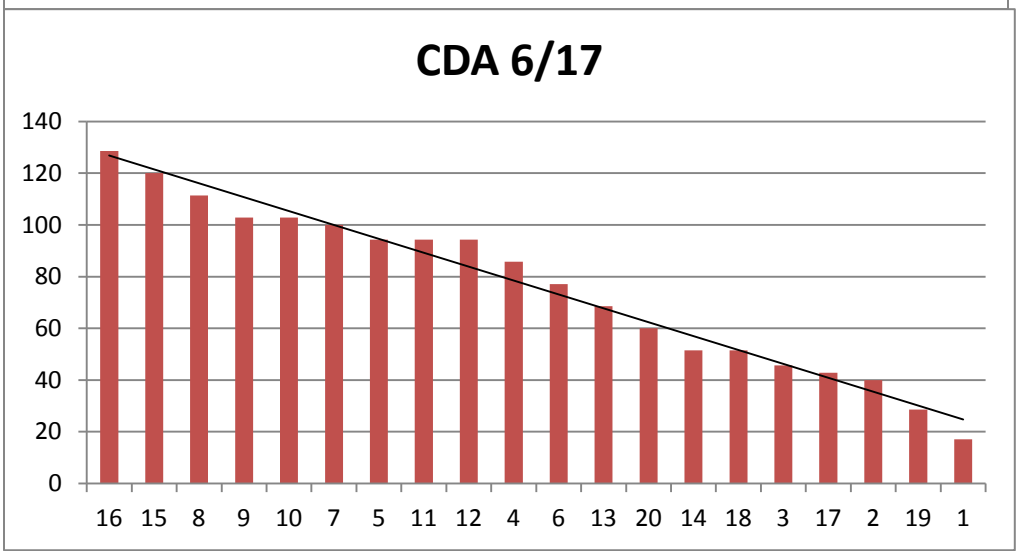
0
13 16 10 15 5 14 12 9 8 6 7 20 11 1 2 3 4 18 19 17
Too Mature
Optimum Gazing
Too Short

1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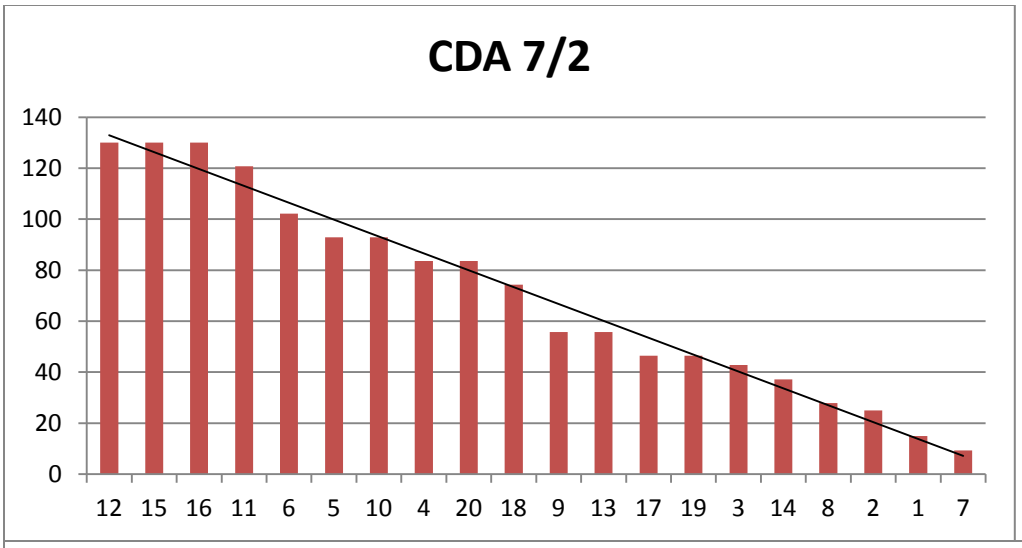
16 15 8 9 10 7 5 11 12 4 6 13 20 14 18 3 17 2 19 1


CDA 7/2
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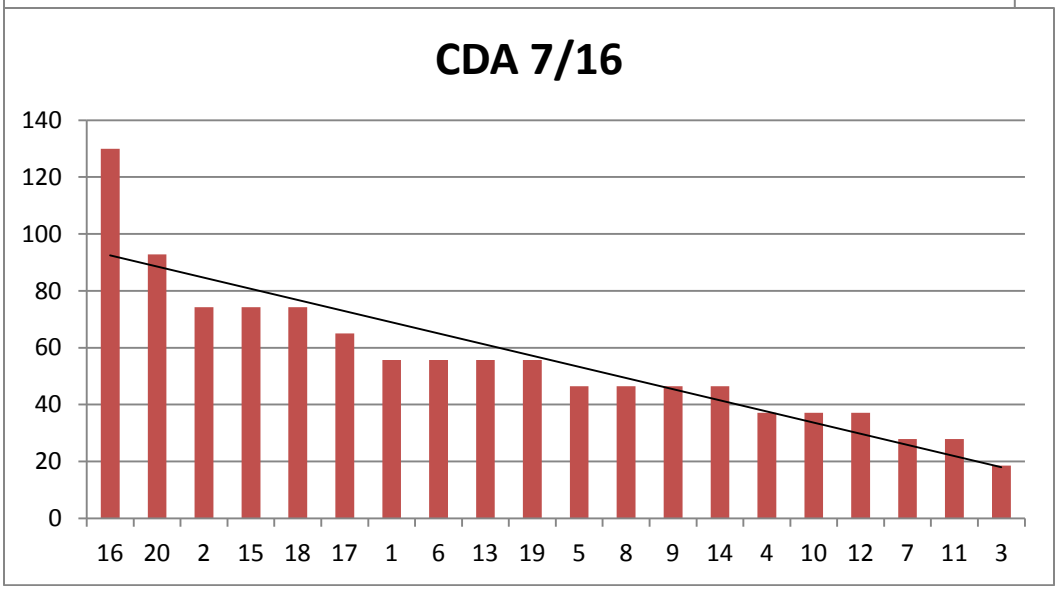
12 15 16 11 6 5 10 4 20 18 9 13 17 19 3 14 8 2 1 7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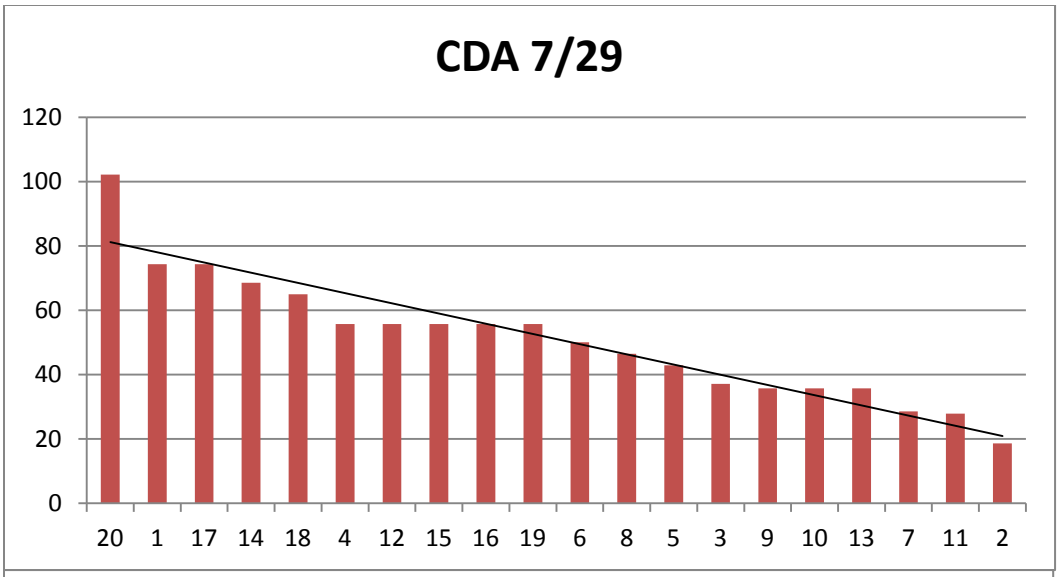
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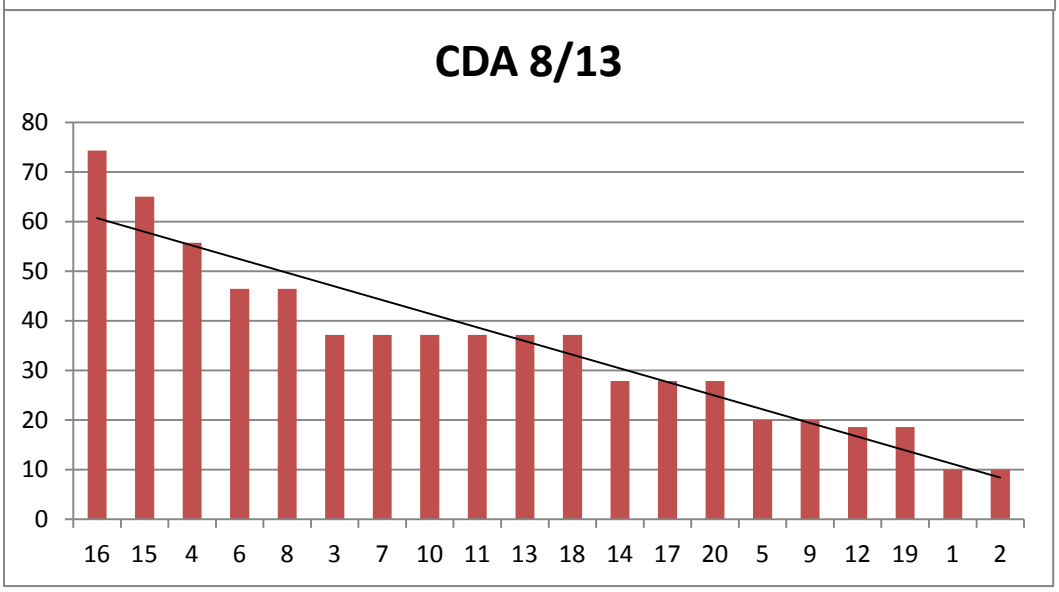
CDA 8/13
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16 15 4 6 8 3 7 10 11 13 18 14 17 20 5 9 12 19 1 2

As seen in the first few grazing wedges, our forage was out of control, but gradually, over the course of the summer, we reigned in our pastures, and by mid-August, our tallest pastures were at or near the optimum. However, due to the drought and high temperatures, regrowth in our pastures had been slow, so we have finally begun to feed hay. We will destock in the next two weeks to achieve a more conservative stocking rate, which will help ensure that we will make it through the winter on stockpiled fescue alone, and though we are currently feeding hay, pasture inventories will continue, and when more of our paddocks enter mid-phase two growth, the cattle will go back out. In the long-term, continuing pasture inventories will allow management to get an idea of an average annual carrying capacity for the property. With continuing data collection, management could better decide when to start spring grazing, increase stock with the spring flush, get an idea of average weaning dates, know when to start stockpiling, when to feed hay, etc. etc.

The biggest problem with the wagon-wheel fencing set-up is that when the weather is hot, cattle drink more water and spend more time in the shade. At Rock Creek, there was only one water source and shade is very limited in the front part of the pastures. Most wagon-wheels rely on water being at the center, which not only leads to low forage utilization on the outer portions of the pasture, but also over-utilization near the water source. At Rock Creek, this was evident in the poor forage quality on the edges of our property and soil compaction at the center (Figures 3 and 4). We


Figure 3


Figure 4

addressed both of these issues over the course of the summer, and though the solutions are not perfect, the amount of time the herd spends close to their forage went up.

We welded the shade structure together with materials that were lying around at the Kerr Center shop (Figure 5). The skids and cross bars are made of drill-stem pipe, five hoop-house bars serve as the uprights, which were attached to the drill-stem in one foot pieces of square tubing. A seventy percent shade cloth drapes over the top, and is simply tied to the hoop-house bars with clove hitches. The base measures 23.5' by 13.5', which allows the structure to fit through all of our gates. At each corner of the structure, we attached a few links of chain to hook onto; an ATV easily pulls the shade structure around (just make sure to make wide turns…). The structure's strength was tested on its first weekend out in the field, as an Oklahoma windstorm, with gusts upwards of 40 mph, did little to move the structure. Unfortunately, the structure is not large enough to provide the whole herd with shade, but the real take away from this project is that the structure was inexpensive and does keep part of the herd out in the field.

The most important piece in the MiG puzzle was the water system. As shown in research by Ron Morrow and Jim Gerrish, forages go under-utilized when cattle are more than 800 feet from a water source. With some of the grazing cells measuring over 1600 feet long, we were dealing with a high percentage of low utilization. Our soils close to the single watering point were also suffering, so the need for a functional water system was pivotal to the success of Rock Creek Farm. For less than twenty dollars per acre, we installed a waterline using one-inch polyethylene pipe. We ran 1,000 feet right down the middle of the property, and using an additional 500-foot pipe, we were able to "T" off the main line and deliver water to the edges of the property (Figure 6). A table showing the itemized cost of the waterline is at the end of this document. The waterline does have a couple of drawbacks. On days when the temperatures are above 100 degrees Fahrenheit the water in the pipe gets hot, and water temperatures in the tank soar to near 110. Cows will readily drink up to their body temperature (just over 100), so hot water is an issue for an above ground line. Ideally, we would just bury the line, but because we want to stay flexible and may try other layouts, the waterline should remain above ground for at least a year before the strategic and financial decision to bury the line is made. To cope with the high water temperatures, I went out to the water tank each day between noon and two and emptied it. When the full 1500 feet of pipe was in use it took between seven and nine minutes for the water to cool down to a point that I felt would last the cows until sunset,

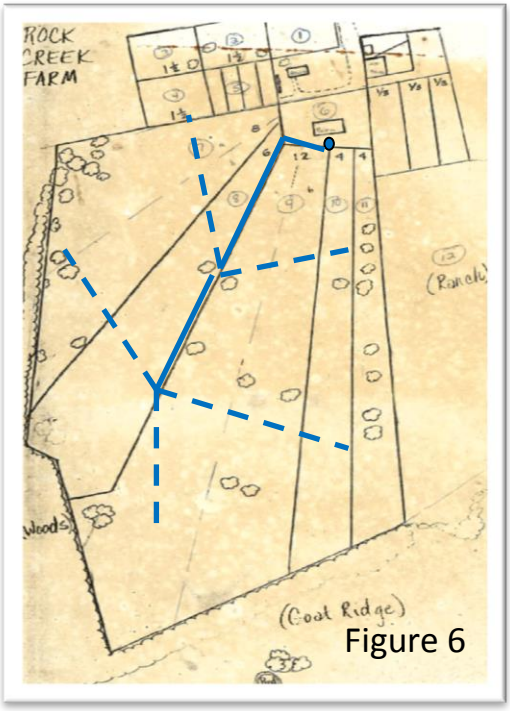

Figure 6

when the line rapidly cooled off. In the wintertime, water will be less critical, so of the pipe can drained and stored until spring.

Rock Creek Farm can serve as an excellent demo site for beginning farmers. In a little under three months water, fencing, and shade were all addressed. The site is now set up for the Kerr Center to conduct future research. To the best of my knowledge, there is not another research site like this in the state of Oklahoma, and with proper management, good data can be collected, the land can continue to improve, inputs can remain low, and maybe a permanent stocking rate of two acres to the cow can be achieved.

Waterline Expenses			
	Units	Price per unit	Total
Quick Connect Female	2	$5.00	$10.00
Quick Connect Male	2	$5.00	$10.00
100 ft. Hose (3/4")	1	$49.99	$49.99
1X3/4" Coupler	2	0.99	$1.98
1500 ft. 1" Polyethylene Pipe	1500	$0.45	$675.00
11/16X1-1/4" Hose Clamp	4	$1.49	$5.96
1" Poly Insert T	1	$1.49	$1.49
1" Plug	1	$1.49	$1.49
Powerflex 1" Elbow	1	$8.50	$8.50
50 ft. Heavy Duty Hose (3/4")	1	$29.99	$29.99
1X3/4" Bushing	3	$3.75	$11.25
100 Gallon Stock Tank	1	$78.61	$78.61
			$884.26

About Rock Gremillion

Houston-native Rock Gremillion graduated from the University of Missouri with two degrees: a Bachelor of Science in Business Management and a Bachelor of Arts in History.

But he chose to come to the Kerr Center for a summer internship because he wanted to continue the "practical side" of his education in agriculture.

He worked with the livestock program at the center and helped set up a Management Intensive Grazing system and demonstration at Rock Creek Farm, 59 acres on the Kerr Ranch.

He sees the market for "humanely raised and healthy animals" growing at an exponential rate, and he plans to seize what he believes is "a golden opportunity for someone with energy and tenacity." He hopes to be in business for himself, raising beef, in the next ten years.