Beef Cattle Cow/Calf Production on Reclaimed Surface Mined Land
Optimizing Production 1997-2010

Investigator:

W. D. Whittier, Department of VA-MD Regional College of Veterinary Medicine
Virginia Tech, Blacksburg, VA

Project Summary

The focus of this project is to demonstrate efficient and profitable production of beef cattle on surface mined land in southwestern Virginia. During this cycle an added dimension has been the employment of management-intensive grazing techniques. A herd of forty-two beef cows and ten replacement heifers owned by Penn Virginia Coal are being maintained at the Powell River Project demonstration site in Wise County. The owners have provided pasture; day to day care and management, supplemental feed as needed, and labor to care for the cattle. Virginia Tech, through the co-investigators, has provided advice and assistance with breeding and health management, marketing, maintenance of pasture productivity, record keeping, selection of sires as needed and strategies for obtaining replacements over time. The overriding goal is sustainable beef cattle production with minimum inputs so that costs can be kept low enough to generate profit. .

Introduction

The Powell River Project has successfully demonstrated that reclaimed mine land pastures are well suited to beef cattle production. Data collected between 1980 and 1991 showed that the land and forage resource could be used by beef cows to produce feeder calves at a profit and that this type of use was sustainable with minimal inputs of seed, fertilizer, lime and harvested feeds. Practices defined by Powell River Project programs are now used by producers in the region and feeder calf production is increasing in the region.

A second phase of cattle production, growing and distribution of bred replacement heifers was conducted each year from 1992 through 1995 when forty-five to sixty yearling heifers were grazed at the project site. These heifers were selected from herds outside the region, brought to the site, bred to selected bulls and sold as bred females at auction at the end of the grazing season. Efforts were made to select cattle that would contribute to improving the genetic potential of commercial cattle in the region. Special emphasis was placed on the use of sires selected for calving ease so that the probability of a successful first pregnancy in these virgin heifers could be enhanced.

In the spring of 1996 sixty cow/calf pairs were purchased and placed on the project. The calves were marketed during the fall of 1996. The cows were rebred during the summer of 1996 using

a combination of artificial insemination and natural service. In 1997 the decision was made to decrease the herd to approximately 30 cows as additional mining in the area usurped a significant proportion of the grazing lands. These cattle have grazed the existing pastures at the demonstration site along with the purchase of some hay and corn for supplemental winter feeding. Steps have been taken to make full use of the forage resources available on site for year round feeding of the cow herd. Fencing, handling facilities, water supplies and other essential inputs are available on site or have been enhanced as needed.

The operation of this cow/calf program has sufficient scale to generate income and to make efficient use of resources and labor. It is comparable in scope to many similar operations that have been established in the region due in part to prior programs of the PRP. The intent of this report is to demonstrate the most cost effective and profitable management strategies for operation of a beef cow-calf herd on reclaimed surface mined land and to demonstrate ways to enhance the sustainability and profitability of such an enterprise. Techniques for management-intensive grazing have been employed.

Justification and Objectives

Livestock production has been demonstrated to be a productive use of reclaimed land. In recent years, more operators have obtained use of reclaimed land by lease or other means and the number of beef cattle in the coal producing counties has increased as more operators have recognized economic opportunity. The bred heifer project of the PRP aided in this expansion and many of the heifers have gone into herds in Wise, Dickenson and Scott counties. However, it appears that there are opportunities to enhance profitability of these operations by making greater use of the basic forage resource and by employing the best management practices available to beef producers. A primary example of such strategies is the reduced use of harvested feed such as hay by better management of the forage resource to provide near year-round grazing. Also, the quality of the animals can be enhanced by use of improved genetics. Marketing procedures have been improved and greater use of proven management practices and record keeping is beneficial. The employment of most or all of these strategies and procedures has been the objective of this demonstration project. The project has the additional benefit to the coal industry and region by showing that reclaimed land can make an important contribution to the economic life of the community. We are now in the phase of the cattle cycle where numbers are low and prices are quite high. This is a time when significant expansion of beef cattle production might occur in the area as opportunities for profitability are perceived.

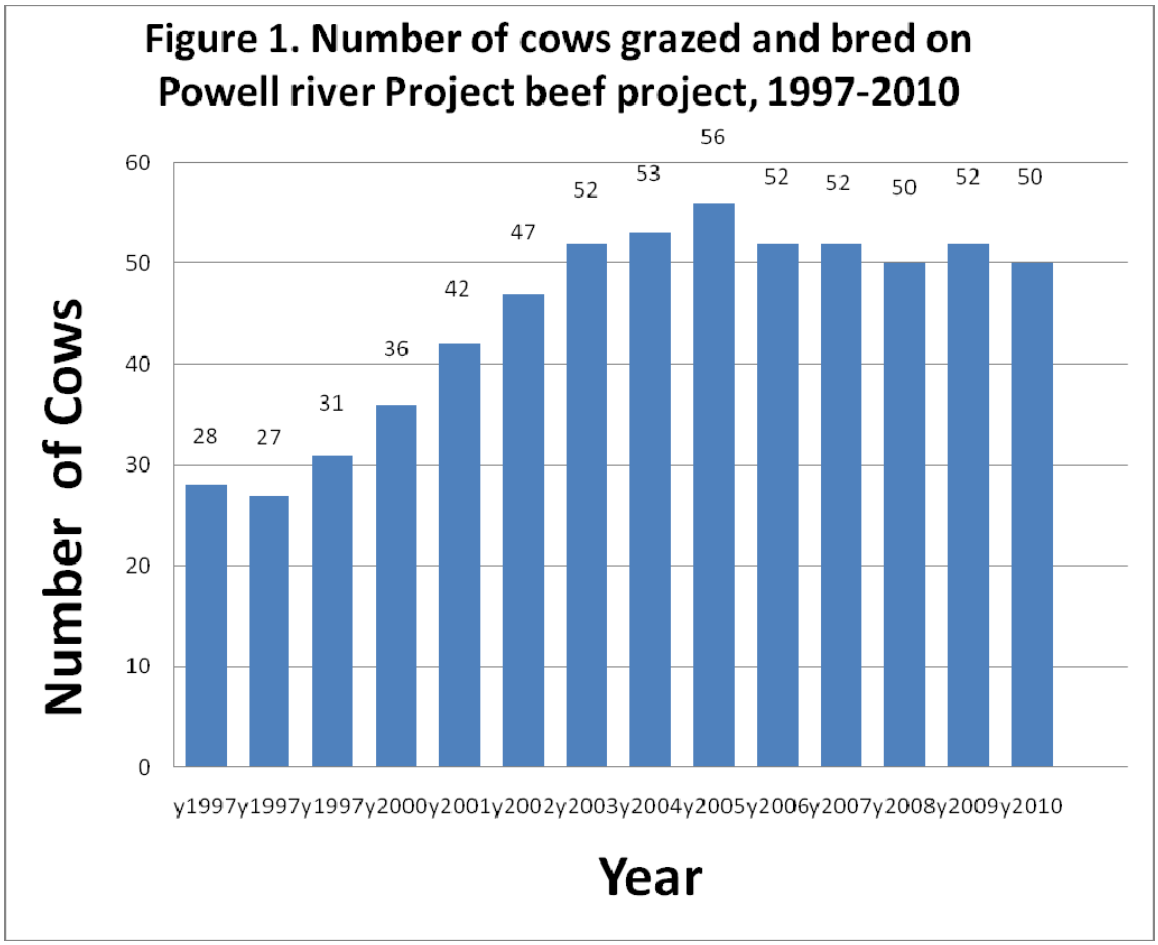
Methods and Procedures

Fifty beef cows and their calves are currently in place at the project site. Seven replacement heifers were weaned and begun development off site over the early winter, then returned to the site to be bred this season. Co-investigators working with Penn Virginia Coal personnel have developed a management and breeding plan for the herd which is being grazed at present. The cows and calves are grazed on the property throughout most of the year with only supplemental feeding when there is severe snow cover during the calving season. Calves are sold between September 15 and November 1. Calving commences about March 1of each year.

Records collected over a fourteen year period of time wee summarized and data is plotted to show trends in cow numbers, success of breeding and calf survival and calf weaning weights.

Results

Figures 1- 3 demonstrate the progress made in production of cattle from 1997 through 2010:



Note that a maximum number of cows was reached in the mid-2000's. It was concluded that running more than about 50 cows wouldresult in the need to buy considerable outside feed for winter needs. It was judged more economical in both dollars and labor to keep the herd numbers near 50 and allow stockpiled grass that grows in the summer and flall to meet most wintering needs.

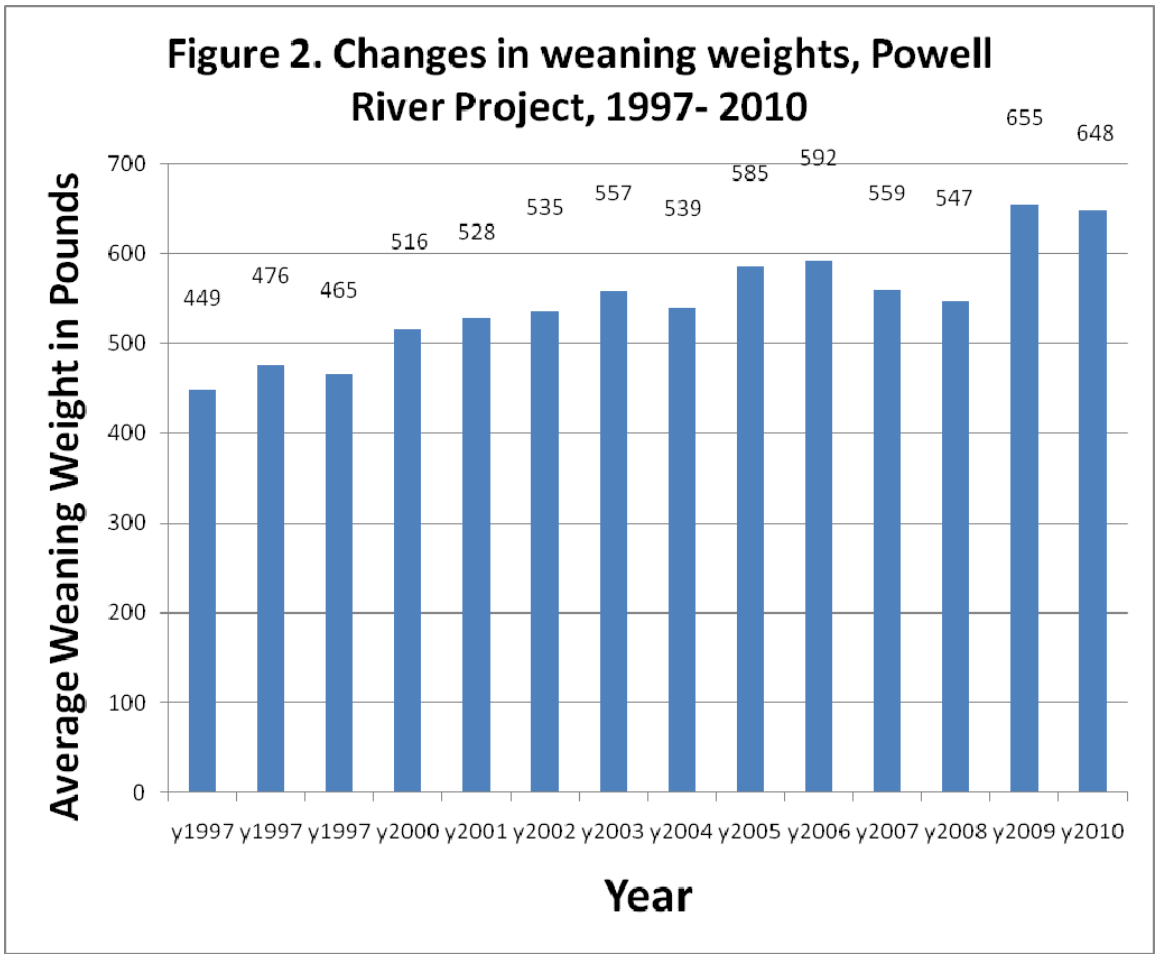
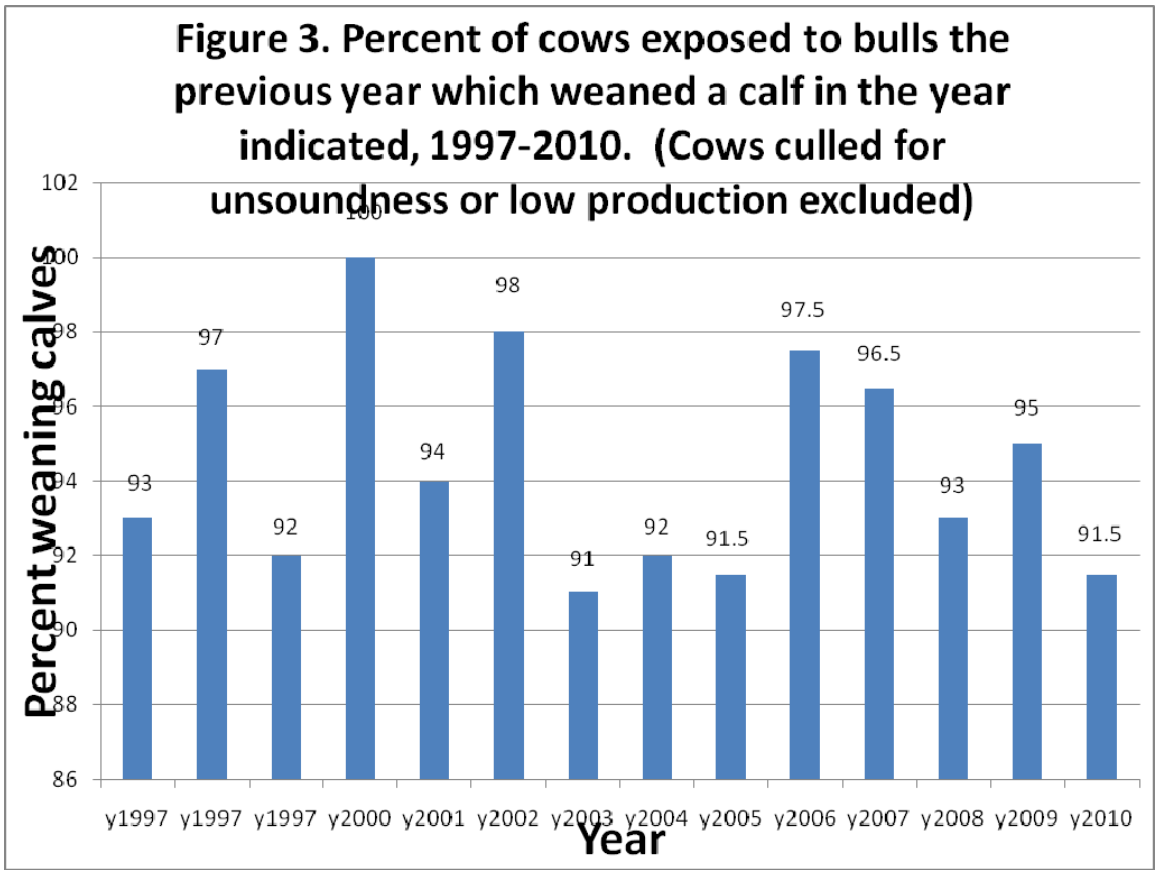


Figure two shoes thaat weaning weights have been continually improving throughour the project. Weights have decreaased during a few years beacause of dry condtions. Use of superior sires, natural and Artificial Insemination, continueal devvelopment of pastures, use of dewormers and growth-promotant implants and better grazing has allowed for the contiula improvement in weaning weights.

Figure three shows that calves weaned per cow exposed has varied somewhat during the project but rates have always been acceptable. When rates have been lover it has typically been because of calf death losses, for example in 2010 because



These figures demonstrate a clear trend in optimizing production of beef on reclaimed strip-mined land. On the same acreage female numbers have been increased, weaning weights have been augmented and although there is some variation, reproductive performance has been maintained.

Major approaches to achieving these ends have included:

- Management intensive grazing principles have been implemented.

- A herd health program to minimize disease losses has been further refined

- By use of artificial insemination and natural service, cows have been bred to sires that have the potential to maximize growth and marketability of the end product - weaned steer and heifer calves.

- A program of fencing, fertilization, overseeding and controlled grazing has been installed to maximize efficient forage production and utilization.

- Water facilities have been improved to provide for high quality fresh water for cows and calves.

Concerns of Toxicity

Concerns have been voiced from various sources concerning the healthiness and healthfulness of cattle raised near a mining site on reclaimed strip-mined pastures. The above summaries of cattle performance certainly refute the idea that these conditions are unfavorable to the production of beef cattle.

The pastures on which the cattle have grazed throughout the thirteen years covered by this report were established by restoring land that had been strip-mined to a relatively level contour. As much top soil as was available was then placed on the surface. Finally, biosolids and wood shavings were placed on the surface to add organic matter to the soil and to increase soil fertility. Finally, a pasture seed mix was applied to the pastures that would grow into plants that were expected to thrive in the environment and provide forage for cows. The seed mix included ladino clover, tall fescue, orchard grass, red clover, sericia lespedeza and autumn olive.

Water sources have been and continue to be a source of challenge for the cattle operation. Originally cavities were scooped into the surface and compacted designed to become pods from water runoff. Many of these eventually filled with silt and became unusable. A tank was installed associated with the barn on the site to capture rain water and this was routed to the waterers for a few years but this proved unsustainable. For several years water was pumped from water filled deep mines below but eventually the electric source was removed. Now, when ponds are dry water is hauled from the river and placed in watering tanks. There is a plan to drill a well to provide long-term, dependable, high quality water for the cattle.

Potential sources of contamination of cattle are the biosolids that were applied to the land when the pastures were established. As the area has continued to be mined, especially from above levels on the site, blasting has occurred and trucks have hauled coal on a road that runs adjacent to all cattle pastures. There is the potential that dust from the coal trucks or from blasting used to loosen rock and coal on adjacent mining sites has contaminated the forages that cattle have consumed. It should be noted that roads are kept aggressively sprinkled to minimize dust. Water contaminated by mining might be an additional source of contamination.

There is a plan to harvest tissue from cows that are culled this fall so that analysis can be made for contaminants such as lead, arsenic, molybdenum, cadmium, etc.

Even though it is obvious that levels of toxins have not been sufficient to hurt cattle production, it must be assured that toxic substances that might be harmful for those who consume these cattle as beef have not accumulated.

Summary

This demonstration is a highly visible example to area producers of what can be accomplished using available information in the most effective manner. It is hoped this will lead other producers to adopt techniques to enhance the productivity of their beef cattle operations.

Cows grazing reclaimed surface-mined land can be very productive. If stocking rates are kept moderate, very little harvested feed is utilized in the production of high quality feeder cattle.