Final Report

Team 65

CATTLE PENS

BY:

James Gorley

Dustin Glover

Final Report

Executive Summary

Project description:
Our project this year was finding the best and most cost effective design for cattle pens. In this project we considered several of the main components that goes into building a set of pens, including (but not limited to): the number of cattle in the pens, the size and shape of the pen, the strength and cost of the materials used to build the pens, and the natural action of cattle.

Computer program:
we have been using StarLogo TNG for our programming language. The cattle that we have been modeling are mostly European breeds; with a few brahmer crosses mixed in. this affected the aggressiveness of the cattle we were modeling. We also modeled the different possible shapes of pens such as diamond shaped and pentagon shaped.

Expected Results:
We expected that an extremely pointed pentagon shape would be the best design. This is because the narrowed point at the end of the pentagon, where we put the gate, should help to ease the cattle through the gate instead of having the gate in the middle of the pen and trying to force them from a very wide space to a very narrow one. It will also make “corralling” the cattle towards the gate easier when it’s time to move them.

Citations:
Modern livestock and poultry production written by James R. Gillespie, produced by Thompson Learning, copyright 2002, Google Earth ™

Final Report

Project description:

Our project this year was finding the best and most cost effective design for cattle pens. In this project we considered several of the main components that goes into building a set of pens, including (but not limited to): the number of cattle in the pens, the size and shape of the pen, the strength and cost of the materials used to build the pens, and the natural action of cattle. In the initial stages of planning stages of our project we were going to try and model everything using the original StarLogo computer programming language. But while we were at the Glorietta kick off conference we learned about star logo TNG. After we saw the new StarLogo we decided to use it instead because it provided a much clearer animation from which to gather data. After Glorietta we started doing research over the different local breeds of cattle and found that the European breeds were the least aggressive. For this reason, we chose to use them in our computer program. After this we started to look at common pen designs. We visited several different ranches and diaries and found that the most common design of pens is: a large square or rectangular area divided into several different holding areas into which would be sorted the different cattle; they would normally be divided by age, and sex. The new arrivals would be kept in separate pens just in case the new cattle have a sickness. Between all the pens there was a system of alleyways and the very end of all the alleyways there was a cattle chute that would hold the cattle still while medicine and vaccinations were administered. After we did the actual walk through of the pens we went online to Goggle Earth™ and viewed many different cattle pens from around the area. From the data we gathered we came up with a basic design that will later be described. Then we started to research the different kinds of materials most commonly used and the strengths of those materials. We had decided to use galvanized pipe and standard 2/4 boards, until we went to the mid-term evaluations where we were told that we

should just be concerned with the interaction of the cattle, the cowboys, and the fence, not the strength of the material.

Computer program:

Through most of the year, we have been using StarLogo TNG for our programming language. The cattle that we have been modeling are mostly European breeds; with a few brahmer crosses mixed in. this affected the aggressiveness of the cattle we were modeling. We modeled the different possible shapes of pens such as diamond shaped, pentagon shaped, parallelogram shaped and the standard square shaped pen. The main goal of our program was to show how effective each design was at containing the cattle and the egress rate of each design. The layout of the pens that we used was three pens set side by side with an alleyway running around three of the sides. In the program we had the cattle being herded toward the gate by the cowboys. The ratio of cowboys to cattle was about thirty cattle per cowboy and we used about 120 cattle per cowboy. We ran each pen design 5 times. Each time we timed the egress rate. From the data we collected we were able to determine the best design of cattle pens.

Results and Conclusions:

We expected that an extremely pointed pentagon shape would be the best design. This is because the narrowed point at the end of the pentagon, where we put the gate, should help to ease the cattle through the gate instead of having the gate in the middle of the pen and trying to force them from a very wide space to a very narrow one. It should have also made “corralling” the cattle towards the gate easier when it’s time to move them. The results we got indicated that the parallelogram designed pen was the most efficient for containing the cattle and for egress. It had the fastest egress time of the pens that we tested. The reason we believe is due to the position of the gate. We placed the gate in the corner of the pen. The angle of the adjacent fence fed the cattle through the gate at an even rate.

Final Report

Citations:

Modern livestock and poultry production written by James R. Gillespie, produced by Thompson Learning, copyright 2002, Google Earth ™, StarLogo ™, Glovers pens